THE

PEDAGOGICAL SEMINARY.

Founded and Edited by G. STANLEY HALL.

VOL. IX. SEPTEMBER, 1902. No. 3.

EDITORIAL.

Mr. Brockman finds that seventeen is the age of most frequent conversions and of greatest interest in religious ideas among 251 students in preparatory schools; that there is great religious perturbation in the middle and later teens; that doubt is a good clarifier. His students and standpoints are those of Protestant Orthodox Christianity.

Miss Lillie A. Williams contributes a valuable and really new article with tables of favorite sounds, words, geographical and personal names. She concludes that those beginning with r and l, and for girls those of flowers are most popular. In an interesting slang curve, it appears that the greatest pleasure is found in this at the age of from thirteen to sixteen. Pleasure in the motor side of speech seems to decline at adolescence, but there is an increased interest in pronunciation, especially of new words, as instruments of thought. The immense importance of hearing in the affective side of language is clearly brought out.

President Frederic Burk's contribution to drawing interest is divided into muscular, imitative and visual. His table shows that with children from five to ten interest in the human figure predominates, and that still life, plants, houses, animals lead, and geometrical design comes second; while from eleven to seventeen the human figure has very little interest and animals have greatly declined. Especially interesting is his parallel col-

umn method of showing the difference between the logical and genetic order.

Mr. Arnett has collected a great body of facts on nest building in the animal world, the development of the nest, burrows for home and for young; and then passes to the consideration of primitive human habitations, the development of the hearth as the center of the home, fire, cooking, the social interest, marriage, love, etc.

Dr. Kinnaman has collected by correspondence an interesting body of facts to show the difference of the educational departments in American colleges, especially twenty-two which were selected for special study.

The Editor reprints a brief address.

An anonymous author furnishes a psychological skit.

Dr. Margaret K. Smith reports on geography.

A STUDY OF THE MORAL AND RELIGIOUS LIFE OF 251 PREPARATORY SCHOOL STUDENTS IN THE UNITED STATES.[1]

By F. S. BROCKMAN, Shanghai, China.

Four years ago, Dr. Luther Gulick and myself sent a letter and accompanying questions to a carefully selected list of college and theological seminary students. My aim was a purely inductive one. I wanted simply the plain unvarnished facts. It was felt that it would not do to question young students about these matters, accordingly I secured my data exclusively from college and theological students. I have not commented on the facts secured to any great extent, as they carry their own message. Neither do I attempt wide generalizations. These are the facts plainly stated from 251 persons. They were from many institutions, and included North, South, East, and West in their geographical extent. In the preliminary study of the topic, I was much helped by papers in Clark University publications. Since coming to China, I have compiled the data secured in America.

I can but feel that the most successful religious work depends to some extent on investigations of the religious life. This paper can be viewed as merely a scouting trip. That it may be of some service to the leaders of young men in educational institutions, is my earnest hope.

Two hundred and fifty-one replies were received from students in about seventy-five different colleges, universities, and theological seminaries, in all sections of the United States east of the Rocky Mountains. Almost without exception, the blanks were filled out with seeming care and conscientiousness.

The average age of those replying was 23½ years. More were 23 than any other age. None were under 16; only 14 were over 30. Blanks were not sent to preparatory school students because it was thought that the college students would be able to give more intelligent and discriminating replies. On

[1]The accompanying paper was made by a fellow worker of mine, Mr. F. S. Brockman. He was personally known to the men to whom the blanks were sent. The care with which they were filled out was a result of this personal acquaintance. Mr. Brockman was then one of the secretaries of the college department of the American Young Men's Christian Association. He now has charge of that work in China. LUTHER GULICK.

the other hand, blanks were not sent to older persons because it was thought the college student would retain a more vivid recollection of his school days. It should be borne constantly in mind throughout the study that the replies are thus from the standpoint of the maturer adolescent. They are from the standpoint also very largely—as the replies to Question 4 reveal —of Christians. From the nature of the questions, it was not deemed wise to distribute them indiscriminately among a body of students.

Age of Joining the Church. There were 247 replies to this question. Ten were not church members. The average age of joining the church is 15¼ years. More joined the church at 14 than at any other age. It is perhaps worthy of note that the average age of joining the church is a little lower than that of conversion, and that 14 is the age when the largest number joined the church, while 17 is the corresponding age of conversion.

Age of Conversion. Two hundred and forty-six students replied to this question. Twelve said they were not converted; five did not know whether they were converted or not; 37 could give no definite time of conversion; 189 knew the date. The average age of the conversion of these 189 is 15½ years. From Table I, it will be seen that a larger number were converted at 17 than during any other year. There were only three who asked for further explanation of the term conversion, or otherwise gave indication that they doubted the reality of the experience. These replies were as follows:

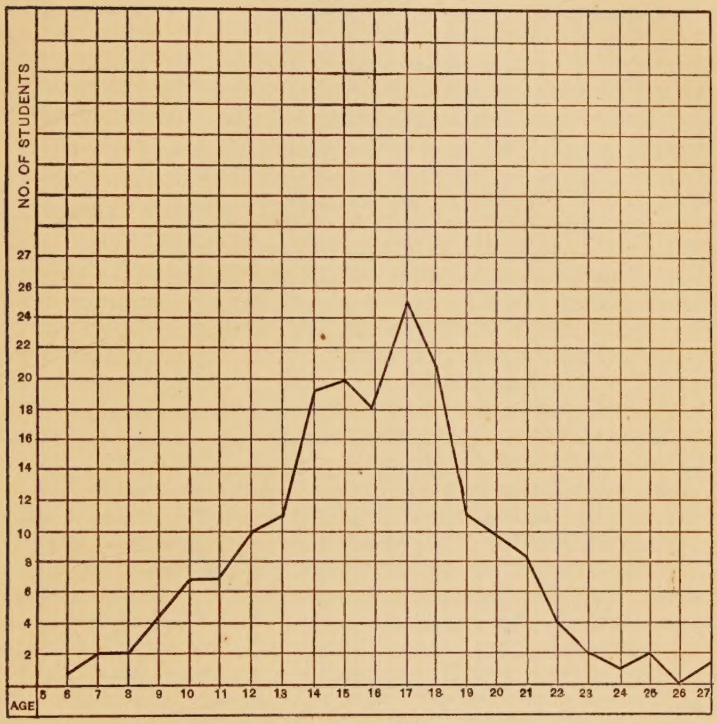
(1) "Not in the technical sense your term indicated. Did not become a Christian. Always have been."
(2) "The term is so indefinite I do not know what you mean."
(3) "What do you mean? I am being turned about every year. I started a new life at age of ten, but have not yet reached the stature of the fullness of a man in Christ Jesus."

A large percentage of the 37 who could not remember the time of their conversion described it as a gradual process. Here are a few typical replies of those who said more than simply, "*I do not know when*:"

(1) "Grew up in the church and had no definite time."
(2) "It has been a gradual, but almost unbroken growth of love of God since infancy."
(3) "Was raised in church and Sunday School. Not suddenly converted."
(4) "The process was gradual, not sudden."
(5) "Grew up in church. Don't know of such a stage. I have no date."
(6) "Yes. I think the growth was gradual, and not due to any particular incident."
(7) "I know of no definite moment which I can look back to as the time of my conversion."

TABLE I.

Age of Conversion.



It was interesting to see whether the replies threw any light upon such questions as these:

(1) Was the Christian experience of those suddenly converted different from that of those with whom conversion was a gradual growth? In other words, are Christians who have been suddenly converted more or less apt to live right than those gradually converted?

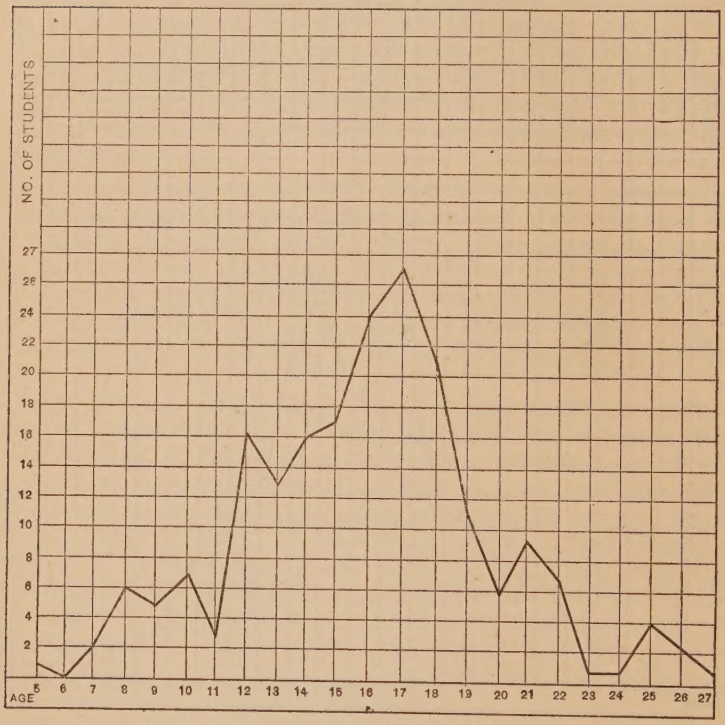
(2) Is there any relation between Christian homes and the method of conversion?

The blanks were carefully examined with these two points in mind. There was no appreciable difference discernible between the Christian life of those suddenly and gradually converted. The home influences of those gradually converted, however, were better than those giving exact time of conversion, the distinctly Christian homes where father and mother were both active Christians in one case being 84%, and in the other 73%. It is doubtful, however, whether the numbers are large enough to justify any conclusion.

Table I shows the number of conversions for each year. It

TABLE II.

Age of Greatest Responsiveness to Religious Ideas.



is compiled from the replies to Question 3. Table II is compiled from the answers to Question 5, and shows the age of greatest responsiveness to religious ideas. The similarity between the curves in Tables I and II, and the prominence of teens in both tables leave little doubt that with most adolescents the years about 17 are apt to mark a religious crisis. There has been much written and much study given within the past few years to the physiological and psychological aspects of adolescence. The physiologist has called attention to the increased volume of the heart, the broadening of the shoulders, the hardening of the muscles, the elongation of the vocal chords, and other physical changes which mark the dawn of this period, and has laid down the principles which underlie the physical training of youth. The psychologists have studied the hopes, dreams, tempestuous passions, influx of new sensations, and general unstable mental equilibrium which characterizes youth and young manhood, and pedagogy is being readjusted in the

light of their investigations. Facts like the above lead one to ask whether the religious aspects of adolescence do not need to be studied as well. Certainly no religious leader can look at the facts which these three tables reveal without raising the question whether the seventeen-year-old youth has been given the attention which the moral and religious crisis of his time of life demands. The day when the young man is most prone to drift out of the church and easiest to turn to the church is the same. The Spirit of God is sovereign, and may deal with a man at any time; no one can set bounds for His working, but the wise leader in Christian work may reverently study His usual times of visitation and modes of operation. There is an element of transitoriness in the religious as well as in many other instincts. It has its flood and its ebb. It has its time of ripening and then unless cultivated and fixed, a time of almost disappearance. Prof. James says concerning the intellectual life of students: "Outside of their own business the ideas under twenty-five are the ideas that serve for life. Disinterested curiosity is gone, the mental grooves and channels set, the power of assimilation gone. It would probably lead to a more earnest temper on the part of college students if they had less belief in their future intellectual potentialities, and could be brought to realize that whatever physics, political economy, or philosophy, they are now acquiring, are for better or for worse the physics, political economy, or philosophy that will have to serve them to the end." It is an equal folly to trust in the future religious potentialities of a young man of seventeen.

Motives for Becoming A Christian. There were 244 students who answered Question 6, giving the motives which induced them to become Christians. In order to give a better idea of the replies, a few are given in full. They are selected at random except that the brief replies simply naming a motive in the blanks are omitted, as they are shown in the list which is given later:

(1) "This is a hard question. I doubt not all these were components of the resultant motive. The uppermost thing was approval of God." (Age 22, conversion, gradual process.)

(2) "When a young child, I became a Christian as I thought; it was through fear of hell. My real Christian life began with a revival under Mr. H. I was strongly influenced by a longing for clean life and heart." (Age 19, converted young, but don't know just when.)

(3) "I think the reason I became a Christian was because I loved my parents, and they taught me to love God; but I shall have to say I have done Christian acts which I should n't have done had no one been looking at me, but I have done a few when no one knew it." (Age 17, converted, 7.)

(4) "I grew tired of living a *moral* life. I felt that there was a higher life for me. I was strongly convicted of sin. There was also a deep sense of God's love for me." (Age 25, converted, 25.)

(5) "Not altogether on account of conviction of sin. I was reared

by Christian parents, and joined the church without much thought one way or the other." (Age 25, don't know when converted.)

(6) "I was led to become a Christian from a deep conviction of sin and a desire to get others to be saved." (Age 28, converted, 14.) (Very characteristic reply.)

(7) "First, external punishment, and second, my recognition of the intrinsic value of Christianity to man and nation, and my conviction that without it the true, manly, noble life is impossible." (Age 22, converted, 14.)

(8) "Never any fear in it. I don't like the idea now. It seems to me to be obsolete—no remorse, nor conviction, but God's love and an ambition to lead an useful life." (Age 20, converted, 11.)

(9) "Conviction of sin and feeling of God's love." (Age 23, converted, 13.) (These two motives are often thus joined.)

(10) "Was much dissatisfied with my life, felt a constant unrest. It was not fear of eternal punishment, but soul hunger which I can't describe. And I had no doubt but that all the rest of the family would be saved, and to think of being separated from them was terrible; and then the consistent life of my mother made me long for the power to become like her. And when I realized how unthankful I had been, and how much I needed God's help to live even a decent life, I called on Him and found salvation." (Age 33, converted, 20.)

(11) "It was the love of God which influenced me. Great revivals had had very little influence upon me, but the love of God influenced me as nothing else and led me to a full submission to Him." (Age 28, converted, 21.)

(12) "Fear of torment, conviction of sin, and especially a desire for God's love and freedom." (Age 34, converted, 16.)

(13) "Desire for approval of others to some extent. Most of all, the sense that I ought to be a Christian in view of all that God had done to that end." (Age 27, converted, 16.)

(14) "Owing to the fact that I was carefully guarded by true Christian parents, I felt no strong convictions of sin; but I became a Christian more from a feeling of God's and a desire for approval of others." (Age 24, converted, unknown.)

(15) "I believed it the right thing to do." (Age 25, converted, 18.)

(16) "I do not believe any had much influence. A natural religious demand was always in me. I am religious because I *feel better* so." (Age 23, converted, unknown.)

(17) "If I know myself rightly, remorse and conviction of sin and a desire to do good in the world led me to become a Christian." (Age 22, converted, 17.)

(18) "I think that I am a Christian. If so, it is because of the carefully thought out decision that to be a Christian was sensible, reasonable and right. Parents' influence strong also." (Age 19, age of conversion unknown.)

The motives mentioned, with the number of students naming each, is as follows:

Fear of eternal punishment, 69.
Remorse, 29.
Conviction of sin, 104.
Feeling of God's love, 86.
Desire for approval of others, 32.
Can't tell, 5.
Desire for the rewards of God's children, 2.
Desire to get the joys of heaven, 4.
Feeling that a Christian must be most happy, 1.

Desire to meet my own in the beyond, 1.
Search for happiness, 2.
Desire for the peace of the Christian life, 1.
Desire for Christian service, 1.
Philanthropic desire, 2.
Desire to help others escape sin I had dealt in, 3.
An ambition to be somebody and do something great, 1.
Realized it to be the plan of salvation and wished to participate, 1.
Determination to make the world better by my life, 1.
Desire for what would give me the most profitable life, 1.
Desire for a life which would best influence fellowmen to become Christians, 1.
Desire to do good, 1.
Conviction only way to realize object of life, 3.
Dissatisfaction with my life, 3.
Desire to be better, 4.
Recognition of intrinsic value of Christianity to man and the nation, 1.
As I was, I could not accomplish that which life was meant for, 1.
Realization it was the only life to live, 1.
Realization the powerful life is the spirit-filled life, 1.
Conviction all best men are religious, 1.
Conviction that without it true, manly, noble life was impossible, 2.
Ambition to lead useful life, 3.
Try to use every effort to lead better life, 1.
Christianity better fitted for me than any other religion, 1.
Feeling of oughtness, 2.
Sense of duty, 13.
Conviction I ought to be for Christ, 1.
Feeling I was working contrary to God's great plan, 1.
Conviction it was right thing, 7.
Feeling it was best way to live, 1.
Wanted to be right, 8.
Desire to do right, 2.
Longing for clean life and heart, 2.
When I realized God willed my salvation, 1.
Carefully thought out decision that to be a Christian was right and sensible, 1.
Desire to improve my life, 2.
Consciousness of my untenable position, 1.
Feeling of condemnation that I was wrong rather than definite fear of eternal punishment, 1.
Inability to free myself, 1.
Sense of my own weakness, 3.
Inability to live right without God, 3.
Realization of Christ's power to deliver me in time of temptation, 1.
Need of a saviour, 2.
Feeling that there was something lacking in my life; that it was not what it ought to be, 1.
Some indescribable drawing toward Godly things and the church, 1.
Soul hunger. Can't describe it, 1.
Yearning for what I did not have, 1.
Inborn inclination, 1.
God wanted me and I wanted Him, 1.
Desire for God's love, 5.
Desire to be in unison with God, 1.
Desire to please God, 2.
Desire for God's guidance, 1.
Desire to get right with God, 1.

Sense of Christ's desire to save, 1.
Love of Christ ever before me, 1.
Love for Christ or God, 4.
My promise to do so if God spared my mother, 1.
My mother's counsel, 1.
Desire to be at one with Christian friends, 1.
Feeling that now was the time if I ever expected to, 4.
To do myself justice, 1.
Tired of living a moral life, 1.
Desire to be right with the world, 1.
Trained up to it; never knew anything else, 1.

Although many motives are almost the same, I have thought it best to thus give the entire list so that even the shades of meaning may be detected. We may classify them roughly as follows:

(1) Conviction of sin, 104.
(2) Feeling of God's (or Christ's) love, 86.
(3) Fear of eternal punishment, 69.
(4) Feeling that it was right to be a Christian, 44.
(5) Feeling that Christianity was necessary to the highest usefulness to their fellowmen, 33.
(6) Desire for approval of others, 32.
(7) Remorse, 29.
(8) Desire for the reward of God's children, 11.
(9) Sense of weakness, need of God's strength, 11.
(10) Desire for God's love and fellowship, 11.
(11) Indescribable drawing, 4.
(12) Miscellaneous, 12.

The following are some of the impressions and questions which abide after a study of the replies to this question:

(1) What have been called the "old-fashioned motives" are far the strongest. It seems unfortunate now that any motives were given in the blanks. This doubtless called special attention to them and caused them to be mentioned oftener than otherwise. It is also doubtful whether such expressions as remorse and conviction of sin, stand for similar phenomena in every case, being terms often used in religious meetings and literature. Even when these considerations are taken into account, however, the predominance of the conviction of sin and love to God is most significant. The wickedness of sin against a loving God is still the fact to press upon young men if one would be most successful in bringing them to change their lives.

(2) It is equally true that fear is a most powerful motive. The fear of hell is much stronger than the hope of heaven. On the other hand, seven students took occasion to call attention to the fact that no fear existed in their minds, and their replies seem to indicate a revulsion of feeling at the very thought of its being mentioned as a motive.

(3) The number influenced by the feeling that Christianity was necessary to their highest usefulness to their fellowmen,

and that it was right to be a Christian, or by what may be called philanthropic and philosophic motives, deserve our attention. When taken together, they are one of the strongest appeals. Their frequent mention is the more striking because they were not named in the blanks. Dr. Burnham, of Clark University, in a most able article on adolescence, *Pedagogical Seminary*, Vol. I, p. 174, has called attention to the great influx of philanthropic desire, and the birth of the philosophic spirit during adolescence. These replies tend to confirm his conclusions: The Christian worker may assume with confidence that most young men want to be right, wish to have their lives in harmony with the plan of God, and therefore, that a strong appeal to their sense of duty will not be without avail. He may feel sure also that to hold out the possibilities of usefulness to a Christian, and the certain injury to many others besides one's self in living in sin, will find a ready response in an almost fanatical love for men which is now ripening in the young man. This is the day when he is a reformer and dreams of the time when he will purify *church* and state, break the chains of the social slaves, etc., etc. He needs but to be shown that none of his lofty ideals are possible without becoming a Christian, and at once he has an overwhelming motive for becoming one. This is why a missionary address is sometimes the best gospel message. Frequent appeal should be made to the heroic.

(4) The desire for the approval of others is mentioned oftener perhaps than one would have expected. It is frequently marked, however, as the secondary and less strong of two motives, and almost never given alone—the parents or some other member of the family are usually mentioned as the ones whose approval was desired. The family tie is still strong.

(5) One naturally asks the question whether there is any relation between motives and the age of conversion. The replies were divided into three groups according to the age of conversion : (a) 5-12 ; (b) 13-17 ; (c) 18-35, and then examined with reference to motives. Fear of eternal punishment, conviction of sin, and feeling of God's love, were equally strong with all ages. The philosophic and philanthropic motives were equally strong in (b) and (c), but almost wanting in (a). The only instance where the sinner's love for God or Christ was a motive was with children under 12.

(6) Another question which arises is whether there is any connection between motives and stability and consistency in religious life. Here also a longer number of papers would need to be examined. No certain light was thrown on the question by an examination of the papers.

Reasons for Not Becoming A Christian before leaving Prepar-

atory School. There were 61 replies to Question 10 which may be arranged in a table as follows:

	Partly.	Yes.	Total.
(1) Was it because you did n't believe Christianity to be true?	5	1	6
(2) Was it because you postponed a decision?	7	29	36
(3) Was it because you were unwilling to give up something?	2	21	23
(4) Was it because you were repelled by men or methods?	10	7	17
(5) Was it because of the influence of companions?	14	7	21
(6) Was it because you were not approached?	5	11	16

The following are in answer to sub-question under (3), "what things were you unwilling to give up?"

Fear of not having a good time.
Giving up fun and being solemn and sober.
So-called doubtful amusements.
Rebelled against idea of the ministry.
Ambition.
Ideas of independence and enjoyment. Christianity seemed too strict and sanctimonious.
Intimacy with old friends.
Fear of ministry or missions.
Impurity and drink.
Put off decision that I might satisfy sexual desires.
Profession of law.
Profession of law.
Fear of living a Christian life.
A good time.
Impurity had some hold, but mostly companions.
Dancing.
Love of the world.
Dancing probably.
Liberty from appearing stiff and saintly.

The following are some of the replies to (6) which indicate the demand in the preparatory schools for personal work:

(1) No one really asked me and urged me to become a Christian after the age of 12. Living an outwardly good, moral life, they may have thought I was a Christian. But for those six years, I was almost persuaded and no one ever tried to get me fully persuaded and definitely decided. I used to avoid prayer-meetings, especially revival-meetings, for fear of being asked.

(2) I do not remember *any one* asking me to become a Christian during my life-time. Perhaps there was an occasion, though.

(3) No one ever spoke to me, and so I was not in the least interested.

(4) There was no friend to whom I could trust, and who would help me to keep the resolutions I made.

The following replies will indicate the delicacy and difficulty of work with young men of this age, and the need of more skill in it:

(1) "I think one strong reason for my neglect of and distaste for Christian life was my parents strongly urging me to be a minister, for

which calling I had and have no inclination or call. Also the attempt to preach when I secretly disliked the work."

(2) "It has generally seemed to me as if the Christian's interest in men's soul is a forced one. It is all done for Christ's sake and not for the sake of the individual. It is the Christian's duty to do all he can to save souls, and he seems to me to take very little interest in saving the man because he has any interest in the man himself. For this reason, no one has very much influence with me."

(3) I went forward at about 15 at a revival meeting held by a man who appealed strongly to our feelings, and I was not really converted, and I have noticed that most of his converts have become back-sliders. I think this one episode caused a feeling of hostility that lasted some years. I think it had a bad influence on me on the whole. Ever since, I have been strongly opposed to this kind of evangelists."

(4) "There was several years ago, a purely emotional revival held in our town. Many of my associates were affected by this, but of course, *nearly without exception* they all back-slid. This was to me something very repugnant."

Probably the two things more worthy of note under the replies to this question are the small place doubt of Christianity plays with preparatory school students, and the dread they have of sanctimoniousness and solemnity.

Most Powerful External Influences in Conversion. There were 236 replies to Question 7. The influences named were as follows with the number of times each was mentioned:

A friend's talk with you, 103.
Preaching, 96.
Example of others, 86.
Home influences, 37.
Reading, 11.
Sunday School, 10.
Mother's prayers, 7.
Prayer, 5.
Bible study, 5.
Y. M. C. A. meetings, a letter, lectures, study of philosophy, prayer-meetings, singing with young people, etc., etc., etc., 31.

The prominence of personal work is too evident to require comment. Under the example of others, the parents are most often mentioned and particularly the mother. It is an interesting fact that while the influence, example, and training of the mother is mentioned many times, her talks are almost never mentioned as an influence in conversion. It is a "parent's influence," and a "friend's talk," which seems to influence. The often noticed restiveness which the youth shows under the admonition of his father or mother is not a sign that their power over him has gone or even weakened. It may be painful to them that he seems more inclined to bestow his confidences on a comparative stranger; but it is questionable whether it is wise to try to interfere with this evident natural tendency.

Circumstances of Conversion. In reply to Question 8, asking

under what circumstances the Christian life was begun, there were 241 replies as follows:

In a revival, 121.
Alone, 41.
Don't know when, 38.
In regular church service (including prayer-meeting, Sunday School, etc.,), 19.
While a friend was talking with you, 18.
Special children's service, 2.
Young People's Society convention, 1.
Week of prayer, 1.

Severest Temptations of School Days. To Question 12, there were 232 replies, not counting 4 which were clearly evasive. Six said they had no temptations. The other answers may be arranged in the following tabular form, giving in the first column the number who named the sin as one of their strongest temptations, in the second column the number who yielded to it, in the third, the extent of yielding where this was mentioned:

	Strongest Temptat'n.	Yielded to.	Extent of Yielding. Slightly.	Much.
Masturbation,	132	131	57	69
Sexual Intercourse,	66	17	10	5
Laziness,	57	36	18	9
Lying,	44	32	19	6
Dishonesty,	33	24	18	6
Swearing,	32	22	10	10
Impure Thoughts,	15	12	3	3
Strong Drink,	10	8	7	2
Familiarity with a girl,	5	5		2
Tobacco,	4	3	1	2
Listening to and relating Impure Stories,	4	2		1
Ill Temper,	4	4	2	2
Procrastination,	3	2	1	1
Gambling,	2	2	3	
Doubt,	2	1	1	
Carelessness,	2	2		
Dancing,	2	2	1	1
Sexual passions,	2	1	1	
Fear of popular opinion,	2	1		
Selfishness,	2	2		
Miscellaneous,	20	20		

The following were each mentioned by one person only, and are placed under "miscellaneous" in the table: Pride, diffidence in Christian work, anger, thoughtless exaggeration, love for woman, sodomy, social dissipation, hatred of brother man, in the world out of Christ, insincerity, moral cowardice, lack of thoroughness, ambition to be a great man, breaking the Sabbath, exaggeration, neglect devotional duties, improper language, fun, desire for popularity, listing.

Almost everything mentioned by the students has been recorded, even though trivial, because it was thought interesting

and helpful to see what they looked upon as sin. The prominence of "laziness" is striking, and no doubt has some connection with the physical changes of this time of life. Teachers call many boys lazy, what is laziness? It probably refers to indisposition to study rather than to physical exercise. In view of the terrible strength and ravages of the sexual temptations, as recalled in these answers, one is led to wonder whether this indisposition to books is not a call to out-door exercise, and whether the failure to obey this demand of nature may not account in some measure for the distressing failure to control the sexual appetite.

There were 42 papers out of 232 in which there was no clear intimation that sexual temptations were experienced. Although the question was not directly asked, and in many other cases it was not clear, still there were 75 who were guilty of masturbation after their conversion, and 24 after they had decided to become ministers.

As much as one shrinks from it, one feels that it would be unfair to the few Christian workers who are now giving special attention to young men, and most of all to the thousands of youths who are now undergoing temptations which their elders do not appreciate, to fail to give at least a few of the almost heart-rending details which this question has brought out. The following are some of the replies:

1 (a) What was your severest temptation?
"Lying, masturbation, sexual intercourse."
(b) Did you yield?
"Masturbation, sexual intercourse and lying."
(c) To what extent?
"Masturbation—O, my God! it liked to have ruined me for life. I yielded to lying to some extent, and also to sexual intercourse a few times."

2 (a) Severest temptation?
"Masturbation."
(b) Yielded?
"Masturbation."
(c) Extent?
"Almost never, except by vile imaginings and terrible passion in the night-times. My belief is that there is no other avenue by which Satan so tempts and destroys boys."

3 (a) Severest temptation?
"Masturbation, laziness."
(b) Yielded?
"Masturbation."
(c) Extent?
"Extensively for a short time; stopped when I learned its vital evil. Oh! that fathers would show their boys the danger in this!"

4 (a) Severest temptation?
"Masturbation and sexual intercourse."
(b) Yielded?
"Both."
(c) Extent?

"The former almost daily; the latter very seldom."
5 (a) Severest temptation?
"To be backward in Christian work, masturbation."
(b) Yielded?
"Both."
(c) Extent?
"The first, I thought that others could do the work better than I. The second, at periods, I practiced nearly every night during my academic course."
6 (a) Severest temptation?
"Laziness, or rather procrastination, and masturbation."
(b) Yielded?
"Both; but masturbation was the stronger, yet the two were largely combined."
(c) Extent?
"Masturbation irregular. Periods of abstinence followed by excess. Conscience said it was wrong, but had no definite information why wrong. Began when about ten or eleven, then ceased with very occasional participation till sixteen. Then continuous till gained definite knowledge about three years later. That with prayer broke the chain of bondage, but now constant prayer and watchfulness is needful."
7 (a) Severest temptation?
"Dishonesty and masturbation."
(b) Yielded?
"Masturbation. Oh, that God would blot this out forever!"
(c) Extent?
"To the extent of sin. Not often, but too often. I would if possible, blot this out of my life, yet I had not been told anything whatever about it in warning. Learned it from jokes and inclination."
8 (a) Severest temptation?
"Laziness and masturbation."
(b) Yielded?
"Masturbation."
(c) Extent?
"Until it was wrecking my life."
9 (a) Severest temptation?
"Swearing and masturbation."
(b) Yielded?
"Both."
(c) Extent?
"Extended over a number of years, ranging from period of several days to several months, (that is, the yielding the latter; as to the former, never, unless I was very angry)."
10 (a) Severest temptation?
"Lying, masturbation."
(b) Yielded?
"Masturbation."
(c) Extent?
"That I was weakened in mental power and vigor. May I say that Sunday is the day when the devil does his best work along the line of masturbation. Fellows get together, tell stories which awaken these passions, and then the temptation is too strong."
11 (a) Severest temptation?
"Laziness, masturbation, sexual intercourse."
(b) Yielded?
"Masturbation and I was lazy sometimes."
(c) Extent?
"Sometimes I would masturbate as many as six times in two weeks.

The most was eight times in two weeks. Then I would go for a while without it."

12 (a) Severest temptation?

"Masturbation, lying."

(b) Yielded?

"Both."

(c) Extent?

"Came near ruining my health by the former."

13 (a) Severest temptation?

"Sexual intercourse."

(b) Yielded?

"None, if it were not dishonesty to some extent."

(c) Extent?

"Deception of teacher and parent."

14 (a) Severest temptation?

"Masturbation and sexual intercourse."

(b) Yielded?

"Masturbation. Thank God, I had no very favorable opportunity for the others!"

(c) Extent?

"I was guilty of self-abuse as often as once a day regularly for about nine months."

15 (a) Severest temptation?

"Unbelief, masturbation."

(b) Yielded?

"Masturbation, through ignorance."

(c) Extent?

"For the same reason that I yielded, I cannot tell to what extent."

16 (a) Severest temptation?

"Swearing and masturbation, and sexual intercourse."

(b) Yielded?

"Swearing and masturbation."

(c) Extent?

"Swore frequently, and practiced masturbation from one to two times a week."

17 (a) Severest temptation?

"Masturbation."

(b) Yielded?

"Masturbation."

(c) Extent?

"Two years, until instinct taught me what my elders were to modest to tell."

18 (a) Severest temptation?

"Masturbation and sexual intercourse."

(b) Yielded?

"Masturbation."

(c) Extent?

"Practiced it to some extent for four years."

19 (a) Severest temptation."

"Masturbation."

(b) Yielded?

"The same. Formed the habit before being converted, and had a hard time in the fight."

(c) Extent?

"I formed it to such an extent that I would unconsciously do it in my sleep. I do n't mean nightly emission, but the act itself (was my worst enemy)."

20 (a) Severest temptation?

"Masturbation, sexual intercourse."
(b) Yielded?
"Masturbation."
(c) Extent?
"A very few times since conversion."
21 (a) Severest temptation?
"I cannot say *yes* to any of these."
22 (a) Severest temptation?
"Masturbation, sexual intercourse."
(b) Yielded?
"To the two underlined. I dare not now write them. I hate the very thought of them. May God forgive."
(c) Extent?
"The first frequently, the second once."
23 (a) Severest temptation?
"Laziness, masturbation, sexual intercourse."
(b) Yielded?
"Laziness and masturbation."
(c) Extent?
"To laziness, *so little* that I kept up well in my class-work. Masturbation has been my most terrible foe. At times, I thought I had it conquered, but it would conquer me again. I have never ceased to fight it, and now by God's grace, I think it is conquered."
24 (a) Severest temptation?
"Masturbation."
(b) "Same."
(c) Extent?
"Only when Satan swept me clear off my feet, possibly at intervals of six weeks."
25 (a) Severest temptation?
"Swearing and masturbation."
(b) Yielded?
"Both."
(c) Extent?
"Moderately for two or three years."
26 (a) Severest temptation?
"Masturbation, laziness, and lying."
(b) Yielded?
"All, to some extent."
(c) Extent?
"Masturbation was continued through my whole high school course, and about a year previous. Excessive indulgence."
27 (a) Severest temptation?
"Dishonesty and masturbation."
(b) Yielded?
"To these two more than any other."
(c) Extent?
"To the latter to an alarming extent, but my attention was called to the evils of masturbation by some patent medicine advertisement."

In reading these replies, one cannot fail to be impressed with:

(1) The alarming extent to which some students practice masturbation.

(2) The morbid state of mind thus occasioned.

(3) The uniformity with which they blame their elders for not having warned them.

(4) The strong hold with which the habit keeps them.

It is possibly true in certain cases that the evil physical results are overestimated by these young men, but when one is brought to *think* that his mind is gone, he is not far from in as bad fix as the man whose mind is gone.

Is not the state of affairs thus revealed serious enough to demand the earnest consideration of the three classes most directly interested and most directly responsible for these young men, viz.: their parents, their teachers, and the leaders of the Young Men's Christian Associations? It is not the purpose of this paper to indicate methods by which the needed work is to be accomplished. These facts show that there is a lamentable lack in the methods now pursued. Parents must not longer rest satisfied with having their sons taught the most delicate and one of the most sacred truths of life at the school, in the livery stable; preparatory and high school teachers have not done their duty to their students when they have given a few hours drill in Latin or Mathematics, when there is a subtle influence which is undermining the mental and moral nature of these same students of which the teachers are unmindful; and the College Young Men's Christian Association cannot satisfy itself with weekly meetings however enthusiastic and largely attended, and statistics of membership, however encouraging, so long as the Association fails to grapple more earnestly with the problem here presented.

To the question in regard to doubts there were 238 replies, 93 of whom had had periods of doubt, and 145 of whom had not. It should be borne in mind that the replies to this question cover the experiences of university, college, and preparatory school days.

The time of doubt is roughly as follows:

13–15 yrs.	8	23–25 yrs.	11
16–19 "	19	26–39 "	1
20–22 "	15		

I say "roughly" because periods were of different lengths, such as 17–20, 13–8, 14–15. The time was marked in some cases by such expressions as the following: "When I first studied evolution;" "junior and senior year in college;" "seasons of trial and application;" "times of despondency;" "when my life was not pure;" "after an emotional revival;" "before conversion;" "always had such seasons."

Some of the periods were characterized by occasional seasons of doubt lasting from momentary flashes to months, while in other cases, the whole period was one of doubt. The length of time the seasons lasted is revealed by answers to question (5) which are as follows:

Short intervals (some as short as five minutes) 33.

Six months, 3.
Short time, but continuous, 16.
About one year, 10.
About two years, 4.
From three to five years, 6.
Eight years, 1.

A great variety of causes for doubt were given. They may be classified as follows:

Ignorance of or neglect to study the Bible, 10.
Neglect of prayer, 8.
Study of philosophy, psychology, botany, geology, comparative religions, 12.
Inconsistent living of Christians, 10.
Sin (on part of the doubter), 11.
Supposing certain theological or denominational dogma integral parts of the gospel, with which it must stand or fall, 2.
Mental growth or development, 11.
Contact with unbelievers, 14.
Seeing seeming contradictions in the Bible, or otherwise misunderstanding it, 9.
Trying to understand things too deep for me, 2.
Unanswered prayers, or other inexplicable personal experiences, 3.
Lack of Christian work or responsibility, 4.
Natural doubting nature or enquiring mind, 4.
Influence destructive critics of Bible, 2
First contact with higher criticism, 1.
Reading skeptical books, 4.
Ignorance of evidence of Christianity, 3.
Social inequalities of our time, 3.

Or dividing into more comprehensive classes:

Natural growth of mind in contact with new subject and new conditions, 28.
Neglect of Christian duties and positive sin, 36.
Influence of skeptics or skeptical books, 20.
Failure of professed Christians to manifest Christianity, 13.
Misunderstanding Christianity and perplexing experiences, 14.

The helps for ending doubt which were given may be classified as follows:

Bible study, 13.
Prayer, 12.
Christian work, 11.
Association with and example of godly people, 13.
Listening to sermons and lectures, 5.
Reading works on Christian Evidences and other books, 8.
Memory of own Christian experience, 4.
Having difficulties explained, 4.
Thinking things out, observation, 8.
Study of science, 3.
Getting right with God, 3.

A careful study of these replies convinces one that doubt is not one of the most serious problems among college students in America, and that higher criticism is not "slaying its thousands, and German rationalism its tens of thousands."

Some helpful suggestions come to one as to how best to deal with doubt from a study of the replies to the questions on the cause and cure of doubts:

1. The doubt arising from mental development is normal, and in every way healthful and helpful. It is but the readjustment of belief when one begins to think, and should result in stronger faith. The young man needs to be kept in association with Christian people whose life will prove to him the truth of Christianity. He should be urged to keep up his private devotions, guard the purity of his life, read good books, and allowed to doubt to his heart's content.

2. The proper treatment of the large class who disbelieve Christianity because they disobey its truth is not to give them further evidences of the truth of Christianity, but to call upon them to live the truth they know. This same treatment will also be the best for the inconsistent Christians who are a stumbling block to others. It is doubtful, in fact, whether it is often the best to deal with doubt in our American institutions directly.

3. It is unwise to let young men at this period of readjustment come under skeptical influence either through books, professors, or fellow-students, where this can be avoided.

4. Careful explanations of some of the more difficult Christian doctrines, the more prominent difficulties in the Bible, and a statement of the fundamentals of Christian truth, would save many from periods of doubt.

5. Above all let the necessity for prayer, personal Bible study, and right living be insisted upon.

CHILDREN'S INTEREST IN WORDS.

By Lillie A. Williams, State Normal School, Trenton, N. J.

In language, as we all know, sounds form symbols of thought; these are first known only through the ear, then they are spoken, still later they are associated with symbols which appeal to the eye, and words may be seen and read. The important thing to be noted is that every one acquires oral language first. When the little child of five or six learns to read he has already had four or five years of practice in calling up ideas by auditory and motor images. Not only so, but back of this lies the whole history of the race, extending down through those ages upon ages when there was no written language appealing to the eye, but when ear and speech were all. It thus comes about that the auditory word center and the motor speech center in the brain are far better organized and developed that the writing and reading center so that the first mentioned with their inter-connections must be regarded as primary and the others as secondary. Indeed it is doubtful whether all the eye experiences of later life ever alter this underlying function of the earlier language centers.

The keen pleasure, then, which accompanies the use of the powers of speech is originally a matter of hearing and of motor activity and in this, the feeling side, the eye never plays any but the most subordinate part, so that in studying this aspect of the function we may ignore the eye altogether, and I have accordingly done so in my investigation.

That the use of the language instinct is a source of delight to very young children is shown by Miss Shinn in her "Biography of a Baby" and by Mrs. Moore in her study of her own child. She records a joy almost approaching ecstasy in his early articulatory performances. That this pleasure in words continues after language is learned I have myself noticed, especially in my study of my niece Helen. Whenever at six or seven she heard a word that attracted her attention she used to say it softly over to herself many times. It was the word itself that pleased her. Thus, after practicing the word "diarrhœa" I heard her say to one of her dolls: "Come here 'Diarrhœa' my dear;" and on another occasion she told me that her dolls had two gods—"Diphtheria" and "Diarrhœa." She took the most extraordinary pleasure in the mere act of articu-

lation. Sometimes she would pour forth a steady stream of words—for the most part utter nonsense—lasting for an hour or more. The charm which she felt in the names was for some time entirely due to her pleasure in the sound and in the act of speaking—Sheherezade, Badrul, Boudour and other names from the Arabian Nights were repeated over and over again. Often she has said to me, "Don't you wish your name was Marie Antoinette, or Adelaide or Sheherezade?" Or she would ask "Which do you like best Rowena or Revena?" or again "Gladys or Evelyn?" When I said that I thought Evelyn a little prettier she went on "I think so, too, because it sounds like Azrael playing upon the harp." Once, as an experiment, I, when asked for a story, recounted the names of the Kings of England and of their Queens. She listened with unabated interest throughout and when I had finished asked me to say them over again. What I noticed in her has been observed in many other children. "B. plays with words," writes a mother as quoted by Dr. Lukens, "using great variety of pitch and inflection."

Does this delight in sounds and articulations cease, when the child acquires the mastery of the instrument and becomes more or less absorbed in language as a useful tool—as the medium for thought? I believe that though it sinks into a less prominent position, it persists not only through the school period but if rightly exercised then, through life. "It is the chief element in our pleasure in poetry, oratory, the beautiful in language in general—or what we call style." To illustrate, Daniel Webster's last words were, "I still live," but the boy in the history class gave, as his version, "I aint dead yet." He has the essence of the thought of the great orator—but all the beauty of the utterance is gone—he has lost the cadence, the pleasing liquid sound of the l's. In short he has offended our feeling for the heard word. Robert Louis Stevenson, one of the greatest masters of style which the 19th century produced, says in one of his letters, "A man learns his art in the crystallization of day dreams: in changing, not in copying fact; in the pursuit of the ideal, not in the study of nature. These temples of art are, as you say, inaccessible to the realistic climber. It is not by looking at the sea that you get:

"The multitudinous seas incarnadine;" nor by looking at Mont Blanc that you find:

"And visited all night by troops of stars."

A kind of ardor of the blood is the mother of all this; and according as this ardor is swayed by knowledge and seconded by craft, the art expression flows clear and significance and charm, like a moon rising, are born above the barren juggle of mere symbols."

In modern pedagogy the doctrine of interest holds sway, so that if there is such a natural interest in words as I have claimed, teachers cannot remain ignorant nor indifferent regarding it. How do children manifest this interest? Do all have it in an equal degree? Can it be augmented by wise stimulation? are questions which they may well raise.

What follows is a little study in this interest. It grew out of an earlier attempt in this same line. One of my students in advanced Psychology became so much attracted by her little brother's pleasure in language that she asked if she might make it the subject of a research. I prepared a little questioneer which we gave to the pupils in our Model School and the returns when tabulated according to age and sex proved suggestive and helpful. It occurred to me to work out the questions at greater length and to give them to the students in the Normal School as a reminiscent study. Miss Alden and I dictated them to the classes in Psychology, and through the kindness of Miss McGuire and Miss Luther, returns were obtained also from the students of the B. year. Young ladies so greatly preponderate in numbers in our school as to practically limit this study to the female sex. I have a few papers from young men but there are not enough to warrant me in tabulating them.

The first inquiry: "When you were a child was uttering words a pleasure to you? Is it now? Did you enjoy talking or reciting because you liked to hear the sound of your own words? Or why?"—was answered affirmatively by 180 girls, negatively by 53, while 24 said they could not remember. Thus responses were elicited from 233 out of the 257 to whom the inquiry came. So large a proportion seemed to me a justification of the attempt to get at the matter through reminiscence, while the reasons stated show certain things which we could not learn from the children themselves, and offset the great disadvantage that we seldom have the exact age when these things were true. May it not be possible, in the light thus obtained, to turn again to the children, and in time to settle the age at each phase definitely. Expressing results now in the form of percentages for future comparison—we have 22.74+ per cent. who did not like to utter and 77.25+ per cent. who did. Of those who answer affirmatively 33.9+ per cent. were unable to give any reason for their pleasure. 25 per cent. say that it was due to the act of articulation. 19.44+ % that it was due to the sound which ensued, while 7.7 + % say it was a combination of motor activity and sound which was the source of the pleasure. 3.9% report that they enjoyed uttering words when alone, but were so bashful that there was no pleasure in it when in the company of others.

5.5 + % state that while uttering words in childhood was a pleasure that it is so no longer now that they have entered adolescence, while 4.4 + % state that the change has been the other way.

The second inquiry "which did you like best to speak yourself or to listen to other people speak? Why?" was answered by 221 in all—153 preferred to listen, 61 to speak, 7 liked both equally well, while 15 were unable to answer. Expressed in per cents. we have:—69.23 + % prefer to hear; 27.6 + % prefer to speak, while 3.16 + % like both. Of those who like best to hear 20.8 + % state as the reason that they were bashful or timid—in short they refer to fear in some form. In pleasure in language, then, we find the sensory side predominating strongly over the motor, the situation being brought about partly by the ridicule which has been experienced in the early—halting—attempts at speech. This naturally leads to the third inquiry, "What sounds or what combinations of sound were difficult or impossible for you to pronounce? As this touched, in most cases, such an early period of life that the subject would probably be unable to recall it, the girls were requested to refer the matter to parents and teachers, and others who had them in charge when they were learning to talk, but even by this plan results were too meager to be expressed in per cents., but I have made a table of the sounds reported, noting in each case the number of persons who mention it. (See table p. 278.) Of course I keep always in mind the fact that the number of returns is far too small to base any generalization upon—still I thought that this table might have a suggestive value especially to the teachers of little children, putting them on the alert for the most common difficulties, thus it is plain that we must give special pains to the functioning of the tongue, which is seen to be the least tractable organ. I shall be greatly interested to learn whether the experience of those dealing with the beginners agrees with the results here indicated.

The fourth point raised—"As a child did you like to hear people use words unfamiliar to you? Did you like to use these same words afterwards yourself? Ill. Do you still do this?" was taken up in view of the fact that this is the chief way in which children enlarge their vocabularies and in the belief that those who genuinely delight in words or in saying them, would probably have an advantage here over those with a less strong interest. My little niece has given me repeated opportunity to study this language interest. One day when she was not yet seven she began reading aloud to me, but after a little she stopped and said "I can't read this, it gives me the apoplexy." Two months later she lost her paint-box; after

TABLE OF SOUNDS REPORTED.

r	24	k and hard c	16
br	1	ch	4
dr	1	g	13
tr	4	b	3
rt	1	p 2	d 2
s	21	ph	2
sb	1	ap	1
sh	3	wh	4
sk	1	w	2
sp	1	j	2
st	1	m	1
th	21	n 1	nt 1
tch	1	a	1
tw	1	e	1
tx	1	ict 1	ion 1
t	1 ct 1	oi	1
l	10	oo	1
ly	1	um	1
	(in middle of word.)	ults	1
lal	1 lll. 1.	y	1
f	13 fu 1.		
v	8		
z	1		

looking in vain for it down stairs, she came up and I heard her say as she went storming through the room, "Oh, that curséd Harriet." Harriet was the colored servant with a genius for

clearing up and putting things away, which Helen did not appreciate.

237 young ladies answered the questions, while 14 were unable to do so. Of those who answered :—

17.7 + per cent. simply said "no."

9.7 per cent. said "no" but that they used the words afterward.

9.28 + per cent. said that while they disliked to hear unfamiliar words in *childhood*, they *now* like to hear them.

13.08 + per cent. simply said "yes."

5.06 + per cent. said that they liked to hear them but were afraid to use them.

40.08 + per cent. said that they liked to hear them and to use them in childhood and *still do*. While

5.06 + per cent. said that though they liked to hear and to use new words in childhood that they do so no longer.

The inquiry "When you were a child did it annoy you to hear words mispronounced? Does it annoy you now? Why?" was suggested by the fact that in certain cases the interest in words is so strong that positive discomfort is felt at hearing them pronounced in any way other than the familiar one. Helen repeatedly showed this when in reading the Arabian Nights to her—a name varied in the least from the pronunciation which she had heard from a previous reader.

260 young ladies answered the questions only one professing herself unable to report. Of those who replied,—

3.08—per cent. simply said "no."

26.15 + per cent. said that it did not annoy them in childhood, so far as they could remember but that it does now.

8.46 + per cent. simply said "yes."

61.54 + per cent. report that it annoyed them in childhood and still does.

77 per cent. (2 girls) said that while it annoyed them in childhood it does so no longer.

When it came to reasons, only 170, that is, less than one-half attempted to answer, and many of these replies were exceedingly vague. 51.76 + per cent. said that it grated upon the nerves or the ear—the two expressions being used synonymously: they are presumably ear-minded persons—while 20.59 per cent. give as their reason that they felt like correcting the speaker or uttering the word correctly internally, apparently these are the pupils in whom the motor is most interesting. 21.76 + per cent. disliked it because it seemed a sign of ignorance and so of inferiority in the speaker. 2.94 + per cent. felt that the word was injured—and the same proportion 2.94 + —disliked it because it distracted attention. Here we have the two extremes, on the one hand those to whom the word is a thing in itself

with a personality of its own—on the other those whose interest in words as such is wanting—the meaning has the field of consciousness.

The next question—As a child had you any favorite sounds? What were they? tends to bring out cases of genuine word interest as the individual sounds do not convey thought and hence we rule out meaning. But, as in the case of difficult sounds the answers were not full enough to admit of being expressed in per cents. 133 pupils say simply that they had no favorite sounds, 24 either cannot remember or don't know, 102 say that they had favorites while 2 say "not as a child" leaving us to infer that they have such now. The table here is interesting when we

TABLE OF FAVORITE SOUNDS.

Vowels.	*Consonants.*
ä—13	l—28
ā—8	r—22
ă—1	m—19
ar—1	n—7
ē—7	s—12
er—2	sh—3
ĕ—2	sl—1
ī—2	hard c or K—6
īne—5	co in coy—1
ing—4	cl—1
ir—1	ch—2
ai—1	f—3
ō—2	v—3
or—1	t—4
ory—1	th—3
oi—4	tr—1
ou—1	tw—2
u—1	tro—1
eu—1	p—1
ub—1	pay—1
ur—1	g—2
ūn—1	gas—1
y—1	gh—1
ye—1	h—1
	w—1
	wh—3
	x—2
	z—4
	zh—1
	Liquids—7
	Mutes—1

compare it with that of most difficult sounds. Observe that *r* which figures as the most difficult of all the sounds, comes high in the list of favorites, being second only to *l* which was somewhat difficult. So, too, *s* is second in the list of the difficult but is also fourth favorite. So the comparison may be

continued. Mr. Bagley, of Cornell, in his experimental study of the apperception of the spoken sentence, found that when a sound in a heard word is not understood, the listener will substitute some sound to fill out the word and that in the substitutions thus made, the sounds of v, l, r, and of t and d were chosen much more frequently than other consonant sounds. Now the first three are among the hardest and the last two among the easiest to learn, so that we notice two reasons why a sound may be a favorite—because it is easy in itself like the vowels—or b—; or because it was hard to master and so is endeared as a trophy of conquest when the struggle is successfully over. Here is a most important reason why we should never allow a child to stop short of complete mastery of a difficult articulation.

The question "Had you any favorite words—not proper names?" elicited the answer "no" from 141 students, "yes" from 85, while 21 were unable to reply. 329 instances of favorite words were given. These I have not had time to tabulate with reference to the relative importance of the constituent sounds—but I give them arranged alphabetically leaving you to make the comparison with the table of favorites next it.

FAVORITE WORDS.

air,
alabaster,
alienate,
although,
always,
archipelago,
artistic,
ask,
astronomical,
azure,
baby 3,
ball,
balm,
banana 2,
bang,
beautiful 4,
bell 5,
bird,
blue,
booger,
boorioboo h gha
bowl,
bubble,
bunny,
buzz 2,
bylow,
cactus,
cadence,
calf,
calm 2,
caravan,
carmine,
casualty,
cat 2,
catarrh,
celestial,
chimpanzee,
christmas,
clock,
coming,
commune,
compass
cooing,
crazy,
creature,
critic,
cushacusha,
dale,
dancing,
darling,
dashing,
dear,
delightful,
dell 2,
dog,
earl,
ecstasy 2,
elegant,
ethics,
fathomless,
fatigue,
fine,
flower, 2,
fragrant,
frolic,
funny 2,
gale,
generally,
gentile,
girl,
gleanings,
glittering,

grandma 2,
grass 2,
great,
grin,
half 2
hark,
harmonize,
hepatica,
heliotrope,
icicle,
idea,
impossible,
inanimate,
incarnation,
joyous 2,
lady,
Sadie Moon,
laugh,
lisping,
lock,
lovely,
low,
loyalty,
lullaby 4,
lulled,
lustre,
mamma 4,
meddling,
melancholy,
mercy,
merrily,
metaphor,
meter,
mighty,
mill,
morning,
murmur 8,
murmuring,
muse,
musical,
naphtha,
napkin,
never,
onomatopoetic,
orphaus,
pantomime,
papa,
particular,
past,
path 2,
pathetic,
patter,
pearl,
plum,
pony,
press,
pressure,
pretty,
prophetic,
psalm,
purity,
quantity,
rat,
really,
realm,
recollect,
remember,
resolve,
rhinoceros,
ridiculous,
rill,
ring 3,
ringing,
ripple 4,
rippling 3,
rise,
river,
roll,
rolling,
round,
significant,
silence,
sing 5,
slate,
solemn,
solitary,
sparkling,
splashing,
strictly,
success,
superior,
superlative,
sweet,
time,
tintinnabulation,
to-morrow,
transubstantiate,
trespass,
Tuesday,
unanimous,
vale,
weird,
whistle,
whizzed,
world,
zenith,

The list should be of value to those who write poems and tales for children and should also aid those who make selections from the writings of others for use in school.

As to proper names—I have already illustrated my niece's fondness for them—When used as a name a word attains its nearest approach to being a thing in itself and so a child's fondness for them constitutes an important part of his word interest. The questions "What proper names did you like best? Did names seem important things to you then?" opened up this field. 221 young ladies said that as children they had

favorite proper names, 25 said that they did not have favorite names, while 15 could not answer. Thus out of the whole number—246—who could answer—89.83 + per cent. had, while only 10.16 + per cent. had not. Here is the list arranged alphabetically under three heads—Geographical names—names of males—names of females.

Geographical Names.

Annapolis,
Bethlehem,
Boston,
California,
Chicago,
Cincinnati,
Constantinople,
Delanco,
England,
Galveston,
Halifax,
Haverhill,
Hohenlinden,
Illinois,
Klondike,
Maryland,
Massachusetts,
Mississippi 4,
Newark,
New Orleans,
New York,
Ohio,
Philadelphia,
Popocatapetl,
Rio-de-la-Plata,
Rio Janeiro,
Riverton,
Rome,
Santiago,
Schenectady,
Trenton,
United States,

Geog. Names—8.
Indian Names—2.

Names of Males.

Abou ben Adhem,
Albert,
Antonio Richetto,
Canning,
Carlton 3,
Carlito,
Charles 3,
Charleston,
Chris,
Christ 2,
Clarence,
Claude,
Clifford,
Clinton,
Crosby,
De Forest,
De Witt,
Douglass,
Dr. Melcher,
Earl 3,
Edgar,
Edmund,
Edwin,
Elmer,
Epaminondas,
Eugene 2,
Francis 2,
Frank,
Franklin,
Fred 2,
Frederick,
Gabriel,
Garret Earl,
Geoffrey,
George 2,
Gerald,
Godfry,
Greenleaf,
Guyld,
Harold 8,
Harry 5,
Hiawatha,
Horace,
Howard,
Jack 3,
Jasper 2,
Joyce,
Kenneth,
Lawrence,
Leo,
Leon,
Le Roy,
Louis,
Lucien,
Malcolm,
Maurice,
Maxwell,
Moses,
Napoleon,
Paul,
Percy,
Ralph 3,
Raymond 2,
Redmond,
Reginald,
Reynold,
Richard,
Robert 2,
Rockafellow,
Roderick,
Roger,
Roland 4,
Ronald,
Roy 4,
Rulon,

Russell,
St. Clair,
Samuel,
Teller,
Themistocles,
Theodore,
Thomas.
Vanderbilt,
Vincent,
Wallace 2,
Walter,
Washington 5,
Will,
William,
Willie.

NAMES OF FEMALES.

Abbie
Ada,
Adelaide,
Agnes,
Alberta,
Alice 17,
Aline,
Alma,
Alta,
Amy,
Anita,
Anna,
Annette,
Arabella,
Araminta,
Arlouine,
Arnetta,
Beatrice 18,
Bell 4,
Bertha,
Beta,
Bessie 25,
Beth 3,
Blanch 6,
Blossom,
Boyd,
Bulah 4,
Carolyn 2,
Carrie,
Catherine 3,
Celeste,
Charita,
Christine 2,
Cinderella,
Clara 2,
Clarice,
Claudia 2,
Clementine,
Constance 4,
Dagmar,
Daisy 11,
Dollie Dinksie,
Dorice,
Dorothy 17,
Edith,
Edna,
Elaine,
Eleanor 4,
Electra,
Elizabeth 4,
Ella,
Ellen,
Eloise,
Elsie 18,
Emily 2,
Emma,
Erma,
Ernestine 2,
Estelle 2,
Esther,
Ethel 15,
Eva 4,
Evangeline 2,
Eveline 5,
Faith,
Fannie 2,
Fedila,
Florence 9,
Flossie,
Flora 2,
Frances,
Genivieve 3,
Geraldine 2,
Gertrude 7,
Gladys 8,
Grace 11,
Gretchen,
Guinivere,
Gwendolyn,
Harriet,
Hattie,
Hazel,
Helen 36,
Helena,
Hilda,
Henrietta,
Hope,
Hortense,
Hulda,
Irene 2,
Irma 2,
Jane,
Jessie 2,
Jo,
Josephine,
Justine,
Laura 4,
Lauretta,
Lavinia,
Lelia,
Lenore 3,
Leona,
Lettuce,
Lillian 14,
Lilly 20,
Lizzie,
Lola,
Louise,
Lucile,
Lucy 3,
Lulu 4,
Mabel 13,
Madeline 2,
Madge,
Margaret 11,
Marguerite 13,
Marianne,
Marie 3,
Marion 4,
Mary 6,

Matilda 2,	Olive 2,	Rose 13,
Maud 7,	Olivette,	Rosy,
May 12,	Opal,	Ruth, 9,
Mercy,	Ora,	Sarah,
Merle 2,	Pansy 5,	Stella,
Mertie,	Pauline 4,	Sue,
Minnehaha,	Pearl 13,	Susie 3,
Minnie,	Phyllis,	Thelma,
Mildred,	Primrose,	Vera,
Miriam,	Rachael,	Victoria,
Millie,	Ray,	Viola 5,
Milly,	Rebecca,	Violet 20,
Myrtle 14,	Rita,	Virginia 4,
Nellie 7,	Rebecca,	Vivian 4,
Nora,	Romola,	Winnifred.

It is plain that to little girls, names belonging to their own sex are much more interesting than those of the other sex, whatever may come to be true later. It will be observed that among boys' names, those beginning with R are most popular, there being 24 of these, while Harold is the best liked single name, appearing 8 times. Notice how R and L rule here. As to girls' names, note that Helen 36 and Bessie 25 lead all the rest, though if we put Lilly 20, Lillian 14, 34 together we have another prime favorite. The names of flowers play a large part: Blossom 1, Daisy 11, Hazel 11, Lilly 20, Marguerite 13, Myrtle 4, Olin 11, Pansy 5, Primrose, Rose 13, Violet 20, showing how even with names—association enters strongly into the interest. One girl states that she believed that if one were called by the name of a flower, as Violet, she would certainly possess the qualities of the flower—these being carried by the name. As to the importance of proper names—215 answer, 22 cannot. Of those who answer, 75.35% state that these interested them, seemed important to them. 24.65% that they were not. Of those who deemed them important 7.44% state that they are so no more while 1.4 + % have changed the other way. As we have noted in regard to flowers, this strong interest in names is not a pure word interest. From the answers we have glimpses of the child passing through a state through which the race has passed, a state in which the name is a thing of importance in itself not to be lightly spoken. We have reference to this in the records of the nations of antiquity—"That thou mayest fear this glorious and fearful name." (Deut. 28: 58.) Traces of it are found in that practice of magicians of the Middle Ages of conjuring by occult words as "abracadabra" and "chrononhotonthologos." In our papers one student says:

"I thought the name helped to make the person;" Another writes:

"I associated certain qualities with certain names." Another would not have a baby brother named Clarence lest the name should make him as disagreeable as certain boys of that name whom she knew.

In other cases the interest seems to have been in the word itself. Some of the answers may serve to illustrate how greatly children differ in regard to this feeling. One writes that she had a special liking for the names of distinguished men, another that she used to like or dislike girls because of their names. Still another writes:—"Yes, I had a great interest in names; one of my favorite pastimes when a child was to take girls whom I knew and try to write a story about them. I began one with a friend but never got beyond the cast because I changed the names so much that I lost interest in the story. I am still very fond of names and love to find those that are new to me." (age 17.) On the other hand one writes "No: I had no interest in names. I skipped them in stories," or a girl says "No: I had a number of dolls that were never named," and another, "No: I did n't call dolls by name." Still another writes:—"I don't remember except that I disliked people for their names."

One enthusiast says: "Names have always seemed to me to be very important things. From a child I have always asked the names of unknown objects and of strangers. When small I thought it very important that cows should have proper names. I remember once asking a child of about my own size the names of her father's cows. She said that they did not have any particular names. This seemed to me a very serious state of affairs."

A young lady writes: "When about nine years of age proper names were quite interesting to me. I remember sitting down with my slate and writing all the proper names I could think of and then getting my spelling-book and looking up all the proper names it contained. My dolls never kept one name for a very long time. I was always sure to find another which I thought prettier than the one in use and so changed at once for the new one."

The next query: "Was there any piece in your school-reader or other books which you liked to read solely because it contained some attractive word or words? What was the piece? what were the words?"—was suggested by a bit of my own experience. As a child of six or seven I had a tremendous liking for a piece of verse in my 2nd Reader because it contained the word "supremest." I remember turning to its page and reading it again and again solely for the pleasure of articu-

lating this word. I did not know its meaning and I have no recollection of the subject of the poem. Another named "Helen Knitting" had a certain interest from the story but more because the word "zigzag" occurred twice in it. I liked greatly to say this. I was not specially quick at learning to read and this word interest proved a valuable incentive to the necessary practice which must precede the use of reading as a means to further knowledge. In answer to my inquiry 170 students could make some response while 80 were unable to do so. Of those who remembered: 48 say no, 9 say yes but can name no piece, and 113 say "yes" and give the words. Expressed in per cents.—

71.76 + had such favorites.
28.24 had not.

While I have the names, I have not had the time to tabulate all properly; let me rather give some results. 105 pieces are named. Those which appear more than once are:

Hiawatha 8,
Wreck of the Hesperus 5,
Excelsior 4,
Paul Revere's Ride 4,
The Brook 4,
Twinkle, Twinkle Little Star 4,
The Bells 4,
Apostrophe to the Ocean 3,
Barefoot Boy 2.
Night before Christmas 2,
The Tempest 2,
Miller of Dee 2,
Procrastination 2,
Last Leaf 2,
Cataract at Lodor 2,
The Raven 2,
Village Blacksmith 2,

It will be noticed that Longfellow is by all odds the most popular poet. Is this because of his word power or rather due to the fact that his poems are more used than any others in our American schoolrooms? A scrutiny of the favorite words show that 30 students like the poem because of the proper names. This is the great charm of "Hiawatha." Of other words 21 are those in which liquid sounds predominate, 12 are unusual or imitative words, 9 are words ending in "ing," 7 are repeated words—as in "The Bells," 5 are specially long words as "procrastination," 8 are names of animals, 3 of plants, 5 are rhyming words as

Forever, never,
Never, forever,

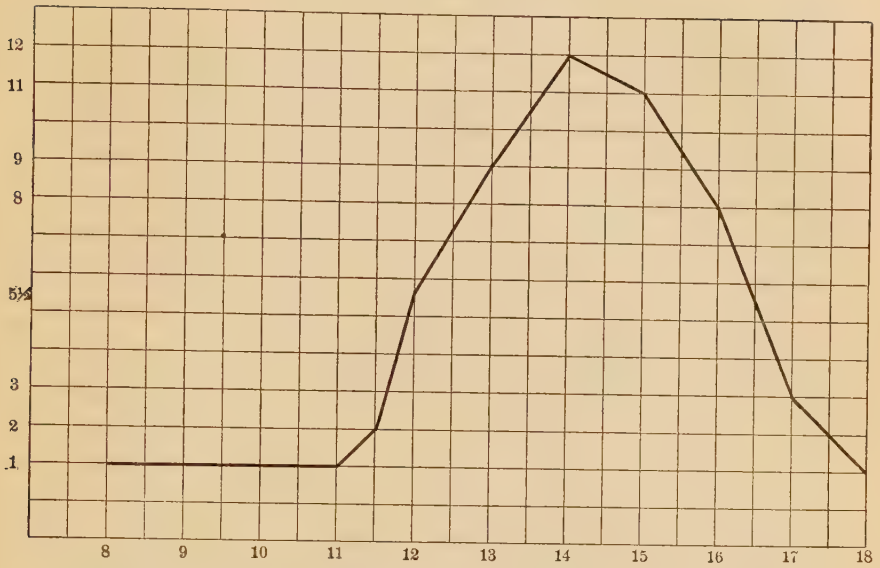
and in a few cases the words are exceptionally short. I hope that such a body of fact is not without value to those who select pieces for children to read or to speak.

Conversation with a student rather remarkable for her command of language elicited the fact that as a child she derived a high degree of pleasure from reading to herself the words in

the dictionary and that this pleasure was greatly enhanced after she learned the use of the diacritical marks and so could produce the sounds which the marks denoted. She believed that this practice materially aided her in gaining her mastery of words and her experience led me to put the next question: "When you were a child were you fond of reading the words in the dictionary, etymology or spelling-book—pronouncing them by the aid of the diacritical marks or by your own unaided power? and do you like this now?" 250 answered this question, while 11 were unable to do so. Of those who answered 150 or 60% say "yes" and 100 or 40% say "no." Of those who answer "yes"—16.8% add nothing more, 21.2% add by my own unaided power. Only 12% pronounced by the aid of the diacritical marks. Several students state that they knew nothing about the marks. 6% say that they liked this practice in childhood but do so no longer, while 4% did not like it in childhood but do now. The results of this inquiry point toward the value of teaching the diacritical marks to children as early as possible, and also to the value of the constant use of them.

The next question—"As a child, did you like to commit words to memory? Was this easy? Do you like it now?" touches upon ground already pretty well explored. 254 young ladies were able to answer, 9 were not. Of those who answer, 167 or 65¾% say "yes" while 87 or 34¼% say "no." Of those who reply in the affirmative 14.96—% simply say "yes." 32.67—% say that it was easy; 6.69% say that while it was easy in childhood it is not so now; 6.3% say that they still like to memorize words; and 4.72—% limit their liking to poetry. The large per cent. who say that they liked this exercise in childhood and the fact that while 6.69—% say that they no longer like it, none at all report the change, as the other way, mark out this phase of interest to be distinctly that of childhood and carries some interesting pedagogical implications.

The last inquiry: "As a child did you find slang attractive and did you use it? Were you criticised for it?" was asked at the suggestion of one of our teachers of English. In answer 226 give some form of an affirmative, 23 say "no" and but 2 fail to respond. The chief interest arises when we note the additional information advanced in many cases. 35 simply say "yes." 61 say "yes" and give their age when it was most attractive—which is expressed on this chart in the form of a curve. 104 say *not much as a child* leaving the adolescent interest unmentioned. 6 say "some." 19 say "I did not use it as a child but I do now." While only 1 says specifically "I did use it as a child but do not now." Of the 23 who



say "no" some are probably limiting their answers to childhood alone. I know this to be true in one case at least. Thus the most interesting fact that arises out of all this is that with girls the period of greatest pleasure in slang is in early adolescence not in childhood. As to criticism only 104 answer: of these 93 say that they were criticised. 11 that they were not. If these proportions may be taken as typical the interest must be genuine and strong for the practice to persist in the face of such opposition.

The second part of the study was directed toward ascertaining adolescent interest in words as such, and was limited to securing a judgment of ten words given as a test. The student was requested to pronounce each word aloud and to determine:—if she liked it—why—that is to hear it—to speak it, for both of these, or for some other reason. The words given were murmur, lullaby, zigzag, supreme, immemorial, incarnadine, burbled, lillibulero, shigshack, annannamannannaharoumlemay. It will be observed that the first six are more or less familiar words while the last four are strange. 245 answered as to "murmur," 5 were unable to decide. Of those who answered 96.34—% liked it; 3.66—% did not like it. Of those who liked it 57.2—% liked it because of the sound. 13.56% for the pleasure of saying it and 10.6% liked both equally well, As to "lullaby" 242 answered, 8 did not, 96.28—% liked it, 3.71—% did not, making it fall short of

murmur in popularity by a very small fraction. Of those who liked the word 52.36—% like it because of the sound, 15.87—% like best to say it, and 11.58—% like both equally. Thus lullaby seems to slip off the tongue rather more pleasantly than "murmur." "Zigzag" has a very different fate from its predecessors. In the first place 40 fail to answer, leaving 218 responses. Of these 43.57% like it. 56.43% dislike it. Of those who like it 41—% like the sound of it 26—% like to say it and 7—% like both. One student gives as a reason for liking it that it is onomatopoetic. This word contains in each syllable the sound of "z" calling for a strong muscular action of the tongue and the g demanding an equally strong effort of tongue and palate together. It is a strain on articulation and the pleasure derived is that of conquest and sense of power as is apparent in the much larger per cent. who enjoy saying it.

The judgment as to "Supreme" is made by 238 young ladies, 23 failing to reply. 198 like it, 40 dislike it. Of the first class 52.5—% like it for the sound, 15.15—% for the pleasure of articulation, 9.1% for both. 9 students like it because it is onomatopoetic. In Supreme we have two strains on articulation, the long u following the s, and the combination pr but the sound of the last syllable is so pleasing as to offset largely the joy of conquest so manifest as to "zigzag."

234 answer the question about "immemorial" while 18 cannot do so. Of those who answer 187 or 79.9+% like it. 47 or 21% dislike it. Of those who like it 57.23% like it for its sound. 14+% like to say it, 7+% like it for both reasons equally. 2 students say it is onomatopoetic, 2 that it has rhythm, 1 likes its looks, 1 likes it because it is long. As to "Incarnadine" 212 answer, 41 fail to do so. 60+% of those who answer like it, 40 dislike it, thus it is a much more unpopular word than its predecessors. Is this due to the "r" in the middle? Of those who like it; 49% like the sound, 16% like to say it. 8% like it for both. One says it is onomatopoetic, one that it is new, one likes it because it is long, and two for the rhythm.

We now come to the words with few or no associations and here we may suppose that genuine word interest will manifest itself with few complications. The judgment as to "burbled," taken from Servis Carrol's nonsense poem "Jabberwocky," is made by 229 students, 29 failing to answer. Of those who answer 70% like it, 30—% dislike it. Of those who like it 60% like it for sound, 15% to say it and 5% for both reasons. These figures are particularly interesting when compared with the returns for "murmur" since the articulatory efforts in saying the two words are much alike.

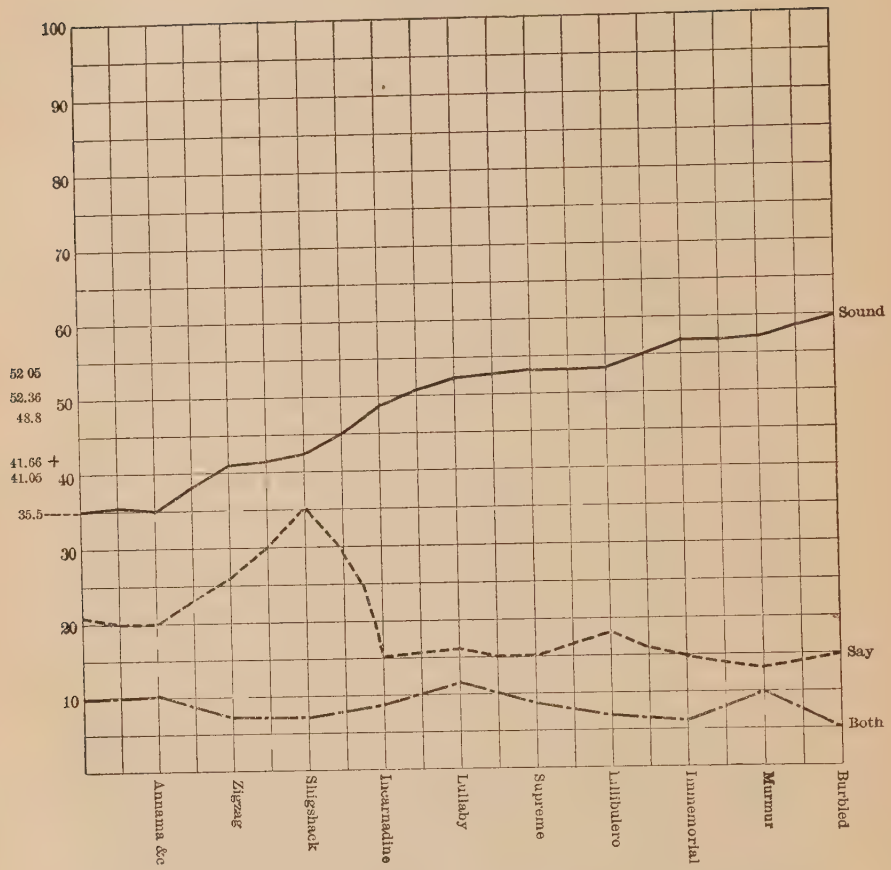
"Lillibulero" is the nonsense word which formed the refrain to a very popular political song at the close of the reign of James II, and I think was either entirely unknown, or seemed so when taken out of its connection, to the most of the young ladies. 231 answer regarding it. 32 fail. 76—% of those who answer like it. 24—% dislike it. Of those who like it 53—% like the sound, 18—% to say it, 7— for both. 5 students say they like the rhythm, 2 like it because it is new, and one for the alliteration. Compare these results with those for "lullaby."

"Shigshack" is a creation of my own and so could not have any associations. 214 make the judgment about it. 46 fail. Of those who judge 28% like it, 72% dislike it, thus making it the most unpopular word in the list. Like "zig-zag," shigshack makes a great demand on articulatory effort and accordingly the joy of conquest appears in the results, for while of those who like it 42—% like it for sound, 35% like to say it and 7—% like it for both.

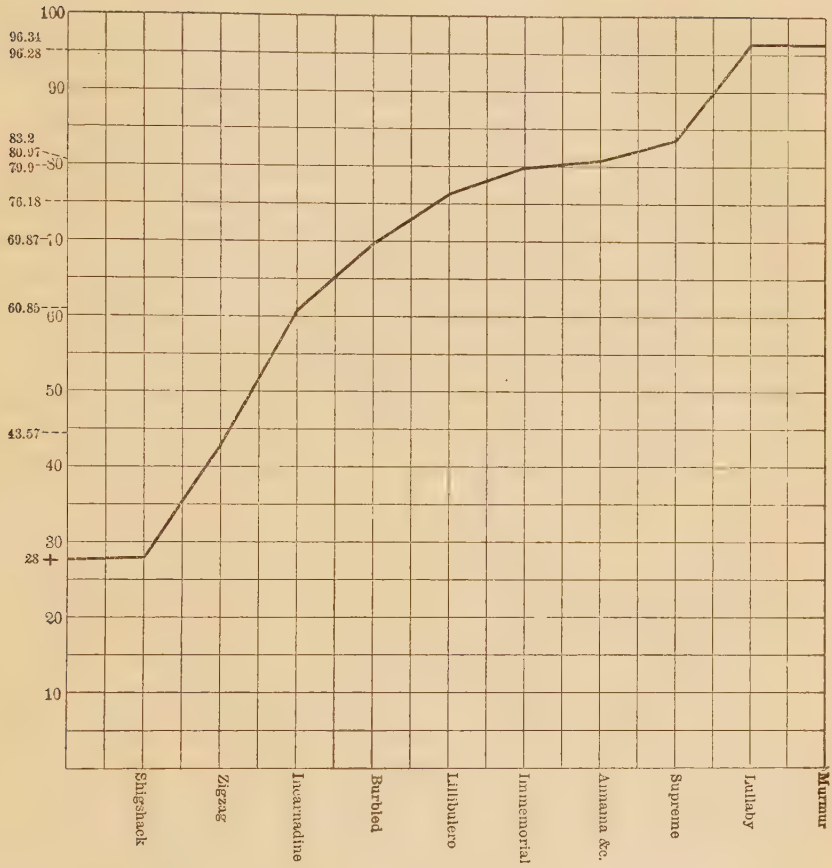
"Annannamannannaharoumlemay" is another of my little inventions. It contains nothing hard to say but it is long. 226 answer it. 23 cannot. Of those who do, 81—% like, 19—% do not. As to reasons for liking it 36—% like to hear it, 21—% like to say it, 10—% like both. 14—% like it for rhythm. All this is seen better when taken collectively so I have expressed my results in the form of curves on these charts. (See pp. 292, 293.)

Now looking over this mass of material as a whole, what is the significance of it? I am not so absurd as to claim any great achievement. It is open to you all to question whether the subject of the inquiry was important enough to warrant a study at all. Granting the thing to be worth while, I keep steadily in mind the fact that the number of returns is absurdly small, and that at least one thousand cases are required in order to secure valuable results, so that it would be folly to claim authority for my inferences. I bear in mind also that the vagueness in regard to age is another factor which reduces the value of the conclusions when one wishes to make any practical application. Still, when all deductions are made, I feel warranted in hinting at certain ideas suggested by a careful weighing and comparison of the results obtained from the answers to the several questions.

As is not uncommon in such investigations, the most important of these ideas, is not one which the questions were designed to investigate:— namely, that there are *two* great periods of language interest. We are prone to think, if we think at all about it, that the first few years of a child's life when the instincts rule, when speech is being learned, when words have the charm of novelty, is the only time when cor-



rect language habits are formed ; there is such a primary period of language interest of course but it is not the only period,— there is a second rise in the tide during the first years of adolescence, constituting a second day of grace for those, who, perhaps through no fault of their own, have failed to properly improve the first. Each of these periods has its own special characteristics. We see dimly from our returns that during the first there is a greater pleasure in the motor side of speech ; a much greater tendency to think of the word as a thing in itself, as shown in the interest in proper names, in having favorite sounds and words, in liking pieces for certain words and in the slightly greater interest in reading disconnected words ; and, as has always been known, great facility in memorizing words and pleasure in the performance.



The adolescent period on the other hand is marked by somewhat of a decline in the motor activity, and the interest in words as things in themselves, with a falling off in verbal memory; but there is at the same time a rise in interest in new words and in pronunciation; above all there is a tremendous rise in interest in words as instruments of thought. The adolescent mind is thronged by new experiences, new emotions flood it, new and larger views of life begin to arise but for the expression of all this he finds his old vocabulary entirely inadequate. The acquisition of words has lagged behind the tide of experience and so we have the dumb bound feeling of which most adolescents at one time or another complain, and also I suspect from this study in the case of girls, we have an explanation of the rise of interest in slang. It seems to be

exhilarating in a moment of verbal deficiency to make an old expression do duty for the new idea, not to speak of the other pleasures which attend the experience. But while the use of slang in early adolescence seems to be in girls entirely natural and interesting, it is a thousand pities to allow a young person to settle down into the slang habit. It must be part of the art of the teacher to know when to allow nature to have its fling and when to draw the curb and bring the vocabulary under rule. To reverse the process is to sin against the nature of the student. In considering these language periods, we are brought to the question are we taking them into account in our pedagogy. Do we change our methods as age advances? The sort of language teaching which is interesting to the small child is deadly boredom to the adolescent and *vice versa*. This early period of intense pleasure in names and new words do we utilize this? Then do we worry the child over faults in pronunciation which he himself will be interested in correcting in adolescence? Such questions as these might be multiplied.

The second idea suggested by our study is the tremendous importance of *hearing* in the affective side of language. The ear is the first avenue through which language is known and the sensations from this organ retain their primacy with most of us through life—but it is especially marked in childhood. Do we always keep this in mind in our pedagogy? We are brought to the necessity of frequent tests for deafness—unceasing efforts to improve defective hearing, and a minute knowledge regarding the individual hearing of each student. Says Dr. Hall in his recent paper on "The Ideal School:" "The child should live in a school of sonorous speech. He should hear and talk for hours each day. We must have less reading, less writing." And we may add that reading should be oral, spelling oral, we need speaking pieces, memory gems, etc.

Then, why is there so much less pleasure in the motor activity than in hearing? Our results lead to the question: "Is it because motor speech activity is so often defective? We see in some of our replies, the pleasure of victory over motor difficulty. I believe that we must be far more exact in our analysis of the speech defects of children as well as more discriminating in our methods of reaching these defects. This is not a matter of small moment if we reflect that failure to speak a word distinctly is usually also failure to think it clearly.

Lastly let me point out the danger of laughing at the word mistakes of children. All the little girls are not equally sensitive but our study shows what a paralyzing effect the fear of ridicule too often exerts. The great means by which the

beginner increases his vocabulary is the imitation of others. In this he must make mistakes, the sound is imperfectly heard or having few associations he mistakes the connection. Every means should be employed to stimulate the activity. Mistakes may pass uncorrected for a time or so much tact used in dealing with them that the tendency is unimpaired.

I have kept you far too long, but the field is so large that even a hasty glimpse requires time. I thank you heartily for the patience with which you have listened to what was doubtless to many of you extremely tedious. The interest which I feel in the subject is my only excuse. As a teacher of Psychology I require at least one important essay from each student during the year. I study the language of these solely as an instrument to express thought. In seeking to understand the far too frequent failures here, I am always led to this question of style and a further quest after the reasons for defects in style has led me to make this excursion up among the little springs where style is born.

THE GENETIC VERSUS THE LOGICAL ORDER IN DRAWING.

By Frederic Burk,
President State Normal School, San Francisco.

It is now some twenty years since President G. Stanley Hall published his study upon "The contents of Children's Minds on Entering School." This publication is regarded as the first step in America of what is known as the child-study movement. During these fifteen years an immense amount of energy has been put forth and the results estimated in number of students, organized and unorganized, in the enthusiam of interest, and even in the quantity of observations recorded, good, bad and indifferent, are something enormous. It has become a study which has appealed to a body of students of wide range of educational foundations, purposes and methods. Parents have undertaken it in the hope that through it they might be more truly parents. Teachers have undertaken it in the hope that it would help them to clearer pedagogic light. Normal schools have made it a significant part of their curricula for the purpose of interesting forth-coming teachers and children. Scarcely a university of any prominence is without a department engaged in child investigation. And in the department of philosophy, child study has pushed itself forward to be one of the main grounds of complaint in the divorce proceedings now pending between psychology and metaphysics. Methods of investigation necessarily have been as various as the purposes and life creeds of the heterogeneous classes of investigators. Necessarily there has been and is much mutual poo-hooing by the self-eyed of these divergent classes; still the work on all lines has gone merrily forward.

It has been evident from the first, that the point of view of child study was likely to prove interesting in the pedagogical field. For the movement started from a standpoint diametrically antipodal to that which has been the established basis of school practice. It has started from the standpoint of the child at his beginning, even in his remote ancestors, and has worked forward on a basis of internal development. Present school systems start from the adult, and work backward on a basis of adult thinking. It has been the interesting speculation from the first whether or not, as in the case of two gangs of workmen

starting to dig a tunnel from opposite sides of a mountain, they would meet in the middle. There is, to begin with, then, two opposite view points for regarding the education of the child; one, that his thinking power develops in the same logical order in which adults do their thinking; the other, that he develops his thinking in a different order,—an order which we may call "genetic." It may be, it is true, that if we analyze the knowledge and training of adults according to the logical order, and then follow the child genetically and watch how he acquires knowledge, we shall find that he follows the logical order, that the genetic order is identical with the logical order as all past systems of education, without investigation, have assumed. But on the other hand, careful investigation may show that the child's method of acquiring knowledge depends upon factors essentially different from those by which the adult thinks; the child may lack certain essential factors which the adult possesses; the logical order may be different from the genetic order and we may be attempting to teach him by an order which is not possible.

The defenders of the logical order can hardly be said to dispute the genetic standpoint. They are rather in the attitude of never having supposed it possible that there could be a genetic order different from the logical. The view of education as expressed by our present courses of study is something as follows:

The starting point of the logical method is what the adult knows in any given subject. This mass of knowledge is collected, sifted of non-essentials, and each part is tapered logically at the end so that it proceeds from what is simple in a logical sense to what is more complex. These tapered courses are then given to children in grades. Applied for example, to the course in drawing, the school has looked over the functions of drawing to adult life and has found that it is used (1) in industrial occupations, (2) in artistic representation and (3) in cultivating a "faculty" of observation. The first step in simplification is to abstract the geometric forms from objects in their practical relations. By this separation of form from practical objects, it is supposed that the work is made easier for children since the material is supposed to distract their attention. The next step is to segregate these geometric forms into an order of *mathematical simplicity*, and it is found that lines naturally are the logical simples out of which grow, by clear logical process, angles, squares, cubes, curves, circles, spheres, etc. All of this material is finally grouped in parallel columns so that if a cross section should be taken at any given level, so much preparation for industrial occupation, so much for art, so much for an observing "faculty," would be found mixed in proportion, approx-

imating that which each of these diversities occupy in adult life. The child consequently begins these forms which are the simplest in a logical sense and proceeds gradually, step by step, through the geometric type forms and finally is supposed to reach the point where form is abstracted from nature. At this point, unfortunately, school education generally leaves him. He is supposed to cross over to nature by himself. He has learned to draw the perfect geometrical form out of which natural forms are constructed. This view of course holds that the business of the child is first to learn the "how," and then the "what" afterward. In other words, it argues for technique before execution, mechanism of formal expression before the idea expression, discipline before doing, grammar before language. It is a principle clearly of wide recognition in all forms of school education and has the advantage of being more or less regarded as axiomatic. To attack the principle of the logical order in drawing, is to attack the main column upon which rests the burden of our present educational structure.

This is a review of an issue which has probably come most distinctly to the front and in a field of instruction in which already there has been several skirmishes—instruction in drawing. Unanimity of existing systems upon essential issues is met by practical unanimity of students of those issues among the child study investigated. Moreover, the subject is an interesting one for the reason that in the matter of children's drawings studies have been made by some of the most prominent leaders of the present child-study movement as the following list of sixteen studies, upon which this review is based, will show.

I. Mass Studies.

1. A study of several hundred children's early drawings, in "Contents of Children's Minds on Entering School;" by President G. Stanley Hall, of Clark University, first published in 1882 and republished in *Pedagogical Seminary*, 1892, Vol. I, p. 165.

2. A study of 15,218 drawings of 6,313 children, ranging in age from six to sixteen years, by Professor Earl Barnes, of Stanford University; *Pedagogical Seminary*, Vol. II, p. 455, 1892.

3. A study of 1,232 drawings by children under 10 years, by Dr. H. T. Lukens; *Pedagogical Seminary*, Vol. IV, p. 79, 1896.

4. Art of Little Children, a study of 1,250 drawings by young children of the Italian school, by Corrado Ricci; translated from the Italian by Louise Maitland; *Pedagogical Seminary*, Vol. III, p. 202, 1893.

5. A Study of Drawings of Children in the Schools of Wi-

nona, Minn., by children from five to seventeen years, by M. V. O'Shea; Proceedings of the National Educational Association, 1894, p. 1015.

6. What Children Draw to Please Themselves, by Mrs. Louise Maitland, from 1,570 drawings of California children, ranging from five to seventeen years; Inland Educator, Sept., 1895.

7. Chapters of "Child as an Artist" and "The Young Draughtsman" in Studies of Childhood, by James Sully; New York, 1896, p. 208.

8. Note sur les Dessins d'Enfants, by Jacques Passy, upon the drawings of Young Children, principally in rural French schools; Revue Philosophique, Dec., 1891, p. 614.

9. Art Teaching and Child Nature, by E. Cooke; in London Journal of Education, December, 1885, and January, 1868.

10. A Study of Motor Ability, by Supt. J. A. Hancock; *Pedagogical Seminary*, Vol. III, p. 8.

11. The Child's Attitude toward Perspective Drawing, by A. B. Clark, of Stanford University, in Studies of Education, Number 8, 1897.

II. Studies of Individual Children and Drawings.

12. Notes upon the Development of the Child, by Millicent Washburn Shinn, University of California Studies, Vol. I, Nos. 1 and 2, 1893-4.

13. Chapters upon "Infant's Movements" and "Origin of Hand-writing" in Mental Development, by Professor J. Mark Baldwin, of Princeton, New York, 1895.

14. "Pictorial Evolution of Man," a series of drawings by children, with comments by Prof. Earle Barnes, in Studies and in Education, Nos. 1 to 10, 1896-7.

15. References in "Development of the Intellect," and "Senses and Will," by W. Preyer, translated by H. W. Brown.

16. Studies of Children's Drawings, University of California Studies, Vol. II, Edited by Prof. Elmer E. Brown and comprising studies by Millicent Washburn Shinn and others, upon individual children up to five and six years of age, 1897.

17. Systems of Drawings published by leading text publishers of the United States and Courses of Study in Public Schools.

It should be understood that this review will attempt to deal with the problem only up to the tenth year or thereabouts, or in other words, with drawing in the kindergarten and primary grades; nothing is predicated upon the problem after that age. It is also distinctly to be understood that this presents the problem merely from one standpoint to pedagogy. In framing any

course of study for practical uses, many other considerations must of course be recognized.

Without exception, all text-books of drawings put forth by the leading publishing houses of the United States for kindergartens and primary schools, and all courses of study except for a few cities and localities, scattered as occasional dots over the American map, are firmly based on this idea of commencing with abstract type forms and proceeding by the logic of mathematics to more complex, industrial and ornamental forms. All forms studied are the simple type forms and their combinations divested of all matter which would distract the attention or interest of the child from abstract form. The systems of drawing in use in the primary grades of the public schools carry this same idea. I take the following from that of the first primary year, assigned by the system which probably is most widely used in the United States and with which all others are in a substantial agreement: lines, circle, cube, hemisphere, sphere, application of these forms to apple and kite, angles, shading, quatrefoil leaf, cross. The primary work and indeed the grammar is simply a development in complexity of these abstract forms.

The first problem will be that of analyzing the factors which appear in babyhood leading up to the point where pedagogy has undertaken the problem of education.

The Scribbling Period.

During the second year of life, possibly in the last weeks of the first year, many children are interested in scrawling or scribbling lines upon paper or slate with a pencil.[1] In the various studies the observations indicate that the child is well on into its third year and even older before his scribbles begin to bear even a remote resemblance to the object which he may be supposed to be drawing.[2]

The progress and the transition is slow and gradual to drawings in which the child makes a distinct effort to represent an object.[3] The child is interested in scribbling lines several

[1] Brown, p. 44, 30-26-18; Lukens, p. 80; Baldwin, 85; Shinn, p. 96; Sully, p. 33-5; Cooke; Ricci, p. 303; Brown, p. 63.

[2] Baldwin points out (p. 86) the growth from angular straight lines to curves, from movements one way exclusively to reverse movements and an increasing tendency to complex intricate figures which he thinks probably results from greatly increased ease, variety and rapidity of movement. Sully concludes, concerning this period, "With practice the child acquires by the second or third year the usual stock in trade of the juvenile draughtsman and can draw a sort of straight line, curved line, a rougish kind of circle or oval and even fits them together at angles.

[3] Baldwin's child began to scribble in her second year and it was af-

1. A muscular interest in the exercise of muscle.
2. An imitative interest in performing acts which the child sees others perform.
3. A visual interest in the mere seeing of the marks the hand-movements produce.

The term "interest" will be used throughout in the broad sense of meaning the impulse which incites to action, whether that impulse is construed as conscious or unconscious, physical, psychical, or both; immaterial controversies will thus be avoided.

I. Muscular Interest.

In the development of any muscular function, Preyer has shown, there is a certain cycle of progressive activities.[1] After muscle and nerve have come into anatomical existence, there is a period of impulsive activity not excited externally; the child twists and turns his body and head for months before he sits up, kicks his legs for months before he walks, babbles months before he utters a sound in the sense of speech. The interest here is, for practical consideration, wholly muscular. It is the play period in the life development of each muscular co-ordination, motiveless and an end and joy unto itself. Gradually developing out of this impulsive activity are actions requiring for their excitation some external stimulus, and still later the movement is excited only by an excitation which constitutes a motive. The child does not exercise for the sake of activity itself, but for interest in something it wishes to do or to possess. While, therefore, the muscular interest, pure and simple is a fleeting phenomenon of the preparatory stage to muscle functioning, nevertheless, since new muscles and nerve adjustments are constantly coming into functional action throughout childhood, in one form or another, muscular interest is probably ever present as an important factor and most predominantly in the early years. We may, then, recognize as a chief factor in this scribble period a muscular interest in mere exercise analogous to leg kicking before walking or babbling before talking. As the function of the muscles involved matures, the interest passes over to the subject matter for drawing.

All observers agree upon the general character of the early

---

ter nine months' persistent effort, at least, before the first rough representative effect appeared. Miss Shinn's niece commenced to scribble at the end of the first year. Sully puts the normal appearance of representative features in the second or third year; Preyer and Ricci think that the end of the third year is the normal beginning of representation. Prof. Brown's study indicates the first half of the third year. These studies would all indicate a period of one, and most probably, two years for meaningless scribble.

[1] Senses and Will, p. 195.

stages of scribbling.[1] There is a "free aimless swinging of the pencil to and fro" in movement purely spontaneous (Sully). Cooke remarks that the child finds his pleasure in the free arm movement. Professor Brown neatly puts it "the child's interest at this period relates to the act rather than to the product."

II. The imitative interest, in general, develops somewhat later than the muscular interest. While Preyer finds some suggestions of imitative acts as early as the fourth month, the impulse is not as widely noticeable by most observers until the latter half of the first year. By the end of the year it is clearly the most striking feature of the child's activity, affecting the motions of the arms, legs and of the speech organs. This interest is clearly conditioned to a very large extent, at least, by the muscular interest, *i. e.*, the child attempts to imitate only those movements which he has, in the elements at least, exercised in the impulsive period. Preyer draws emphasized attention to this fact; the child in his impulsive period practices a large number of movements and adjustments and imitation comes in as a force in the selection of certain of these movements for practical use. He makes it appear extremely improbable that in learning to speak the child ever imitates the sound which has not been an element of his purposeless practice in the impulsive period. Sully also places emphasis upon this selective activity. The pedagogic method of nature is clear; it uses developed forms of activity and does not seek to build up new forms for itself.

As in the case of the muscular interest, so with the imitative interest, there is first a period when it acts for itself, but later, this interest passes over into the object imitated. Young Preyer at fifteen months, long before he could speak or understand the significance of reading, would amuse himself by holding a newspaper before his face babbling aloud, in simple imitation of an action he had observed in his elders. Baldwin observed his child, during the earlier period, looking not so much at the picture drawn, as at the movements of his hand and arm. He says the first attempts were "simply the vaguest and most general imitation of the teacher's movements, not the tracing of the mental picture, and the attempt was no better when a copy was made by myself on the paper." Dr. Lukens, writing

[1] Ricci finds a network of lines running in all directions without displaying the least intention of representing anything. (p. 303.) Baldwin describes the movement in his child from her 18th to 27th month: "At first she made only sweeping arm movements, then began to flex the wrist somewhat and toward the end of the series, with no teaching, manipulated the pencil with her fingers considerably." (p. 83.) He finds at the ages up to the 27th month, no connection apparent between a mental picture in consciousness and the movements made by the hand and fingers.

of this period, says: "The most that can be said is that the child imitates in a general way the outward movements that he sees older persons make in drawing. He has not yet gotten the inside view of the process but only its outward, mechanical movement."

III. Another interest which probably to some slight extent impels the child to scribble is that of sight. But in its simple, unassociated state, this is extremely transitory and the interest in mere seeing soon passes over into interest in the objects which are seen. There is reason to infer, both on anatomical and objective grounds, that the main muscular adjustments of the eye mature early in babyhood. Preyer considers co-ordination complete at the end of the second month.[1] Miss Shinn's niece was able, at fourteen months, to pick out from bourgeois type, lower case, the letters "o" and "s." For simple interest in seeing Miss Shinn's notes show interesting facts.[2] But early in the second year, the child's interest in seeing is evidently that of the associated interest which the objects call up. The child will be most interested in those objects which he has seen definitely and has had most firmly and repeatedly associated with feelings of pleasure and pain. On this ground, the face of the child's mother is likelier to be an earlier and stronger interest and more capable of gaining control of his motor apparatus than objects forced casually upon his attention.

The child's ability to see and interpret pictures in some crude way, comes in probably in the second year.[3]

The next step of significance is, when out of this scribble, there appear formations vaguely and distantly resembling the model. Professor Baldwin (p. 90) explains the psychology of this transition somewhat elaborately. Briefly, his explanation is that in the scribble period the child's drawing movements are merely muscular, uncontrolled by the visual centers which correspond to the visual image of the object to be drawn; that gradually these visual centers gain control of the muscles of arm, wrist and hand in drawing and the child begins to make drawings in crude resemblance of the mental image. One is prone to gain the notion from the emphasis Baldwin places

[1] Senses and Will, p. 38. Donaldson: Growth of the Brain, p. 165.
[2] Shinn, p. 85.
[3] Miss Shinn thinks Ruth closely associated a pictured cat with real cat at the tenth month; but certainly at the 14th month she picked out her father's photograph from a group picture of eight figures and shortly later, would call by name photographs of other members of the family. Pollock (Mind, Vol. III, p. 393) says his child understood the general significance of pictures in the 13th month. Sully (p. 309) has a case of recognition of pictured animals at 10 months, but he thinks this early form of recognition is probably on a level with Romanes's animal "recepts."

upon the details of the psychological explanation that there is sudden and complete transition. But, as the studies yet to be presented will show, it is of essential importance that this process of transition from muscular to visual control is an extremely gradual one, persisting in all probability throughout the kindergarten and primary periods. The tendency to regard this transition as something sudden and complete has led to most of the serious errors in the present systems of drawing instructions. It has been concluded that from the moment the child shows crude tendencies towards representation, he is ready to set up in business as a draughtsman, artist and observer. Pedagogy has at this point seized him upon the assumption that he is matured, anatomically and functionally, to perform any requirements made of him. On the contrary, these studies will show that the early post-scribble period is a mixture of muscular and visual attempts to control his arm and hand movements and that we must for years regard muscular control as dominant.

There are several peculiarities of the drawings of children emerging from the scribble period and persisting for a longer or shorter period. Many have bearings upon the pedagogy of the problem. We might consider the chief ones in the following order:

I. The child is inaccurate in a physiological sense.

(a) Traces of the aimless and purposeless scribble persist for months and even years after the child's drawing, in many respects, has representative features.

(b) The control of the child's arm and hand movements by his visual centers receives interference from muscular association and motor images and thus tends to break away from visual control interspersing the drawing with things felt and known as well as things seen.

(c) The child is inaccurate in the use of typical, geometrical forms, does not draw straight lines, lacks ability to see and arrange figures geometrically and logically. This tendency persists throughout the period under consideration.

II. The child shows generic interests in method and in the choice of subject matter for drawing.

(a) He shows tendencies which are probably due to the mixture of muscular and visual control expressed by his confidence in ability to draw.

(b) He shows a distinct preference for drawing objects which are connected with the human personality and activity.

III. The child is inaccurate in a psychological sense.

(a) He misplaces parts of a whole figure, *e. g.*, he puts eyes sometimes outside the head, legs detached from the body, leaves out neck, etc.

(b) He draws what he knows, not exclusively what his eye sees at any given moment.

(c) He is inaccurate in perspective effect and technique.

(d) After a child has learned to draw some object or some feature of an object in a certain way, this scheme or diagram tends to persist in later drawings regardless of differences of position of the model, either in visual sight or in the memory of the young draughtsman.

I. Physiological Inaccuracies.

(a) The scribble impulse, the uncontrolled and probably uncontrollable exercise of muscle generally continues in parts of the drawing of certain figures after the child is able to draw other parts of the same figure with some degree of representation; in the human figure, face, features and legs will generally be represented while other parts will be omitted or scribbled. This fact is very clearly shown in the progressive series of drawings to be found in those published by Professors Lukens, Brown, Sully and Cooke. The visual centers gain and hold control upon certain parts but are not able to maintain them in others. In a large percentage, this scribble tendency is to be observed in the drawings of kindergarten age and even of the primary school.

(b) There is every reason to believe that in early childhood, motor images derived from joint and muscle sensations of movement, form a larger proportion in the make-up of child ideas than in the adult mind, as compared with visual and auditory images. Drawing, in an artistic and industrial sense, requires the segregation of visual control, and its complete influence over the movements of drawing. To obtain this control has been the chief battle of the drawing teachers under the present systems; and genetic psychology is inclined to protest that methods of forcing are employed. The child frequently mixes up with his drawing movements those not directly under control of the visual centers. Froebel (Education of Man) observes "Here comes a bird flying, and thereupon the child draws a line symbolizing the direction of the supposed flight of the bird." Children will draw the wind and other invisible things. Barnes tells of a small child who drew a line from a boy's eye to the sky explaining that he could not make the boy look up and the line was to show he was looking at the clouds. Brown (p. 65) describes a little girl drawing a picture of her papa dancing and drew a zig-zag line which she explained represented the dancing part. "The movement of papa's dancing," comments Brown, "was as much a part of the image as was any one of his visible features."

The principle of which these illustrations are typical is that

the visual centers are yet in a period of very immature development and are constantly interrupted by other impulses. Passy (p. 661) tells of a little girl under his observation who in drawing from a model made a very gross error, which she later saw and attempted to correct by drawing the object over again; in four successive attempts, the error was repeated showing that the force of muscular association was greater than the visual centers could overcome.[1]

(c) The conflict of the genetic and the logical order at this point is that the logical order takes no account of these conditions. Still more conflicting is the view requiring accuracy in the seeing and drawing of geometric form with mathematical precision. Froebel, as is well known, placed the mathematical sense the first in order, as it is logically, and the systems have adopted this theory. Accuracy and precision are essential prerequisites from the logical standpoint that technique precedes execution, clearly justifying the endless fine work and insistence upon accuracy in the kindergarten and primary school. But the genetic view sharply contends on the grounds of health and preservation, against injury to immature forms of development. A few studies have been made quantitatively by psycho-physicists in this field, those of Hancock, Bryan and others.

II. Generic Interests in Material and Methods of Drawing.

It would seem from the genetic standpoint, that we are brought to a standstill, that all drawing must be prohibited until the child is nine or ten years of age perhaps. Yet, it is admitted by all, that exercise is essential as a function of growth in the period of immaturity. It would seem that the genetic claims have forced the problem between Charybdis and Scylla.

But, at this point, the genetic argument introduces a new

[1] This feature of motor control is capable of immense enlargement but it would lead deeper into psychology than the limits of this review would permit. Briefly, there is evidence of phylogenetic influence as well as ontogenetic grounds that the visual centers are less of a central office through which the ideas of the adult are adjusted than in childhood; that ideas expressed in visual terms have more of a sub-conscious muscular basis than introspection commonly reveals. Dr. S. Stricker in his interesting monograph (Bewegungsvorstellungen) elaborates from careful, personal introspection a most suggestive line of thought. He contends that to imagine clearly any moving object, he feels distinctly a sensation in his own muscles which would be employed were he to make this movement; for example, in imagining a man walking he feels the sensation in his thigh muscles; in imagining a horse pulling a load he feels sensations in the breast. If he forcibly suppresses the sensation strictly declares himself unable to imagine the movements from which he concludes that these sensations are essential to the imagination of movement.

factor and claims for it the absolute authority of pilot. This is the principle of natural interest viewed as an organic expression of physiological states. In this form, this is a principle which has not been recognized by the adherents of the logical order; to do so would be to introduce a factor likely to come in conflict with that of the logical order itself. Interest, as it has been treated by the upholders of the logical order, is an ephemeral state, of no real or organic significance, to be used as a convenient expedient or excited by temporary devices; but in the sense in which the word is now being put forward, in genetic psychology, its recognition urges a principle with roots as deep as logic and of more mandatory significance for the period of childhood. If interest is the principle of the importance claimed for it, the struggle for life or death of education by the logical order in young children must take place at this point. For it cannot be denied that much of the school work under the method of the logical order is and can only be accomplished directly in the teeth of interest shown to be generic and deeply rooted in hereditary tendencies in all probability. Pedagogy has been forced to decide between the logical order and interest so many times, and so axiomatic to adult minds does the argument for the former appeal, that the child's interest has been whipped into submission, branded as an untrustworthy will-o'-the-wisp until the whole process has been established as a fundamental pedagogic virtue. In recent years, metaphysicians have unloaded upon the subject a lot of offal from their decaying structures and created about it a necessary but unfortunate prejudice. But interest as put forward from the biological standpoint is something different from the brand heretofore sold in metaphysical and pedagogical markets. It claims an origin as deep and a sway as important in many lines as heredity itself. Hunger and thirst are forms of this interest; they are the voice of certain physiological needs. So, also, are the desires for fresh air, for warmth, for athletic exercises in a hundred different ways. We all recognize these interests and have no doubt of their authoritative right of command from complex physiological conditions. There are, it is true, in disease, hungers and interests which are false, though I believe that physicians are now generally laying it down as a principle that while the hungers and wants of the invalid sometimes deceive, still in the absence of any better criterion these are the safest guide for determining what the patient should do. But pedagogy deals not with the sick and abnormal but as a rule with the normal. The principle appeals in an even more stable form than in medicine. But when we admit the feeling of hunger and other bodily impulses as reliable indicators of delicate physiological state, we cannot logically stop with these. Dispositions,

tempers, traits of character, instincts, emotions, love, music, art, faith, and even the religious impulses, whose roots perhaps reach back into countless ranks of ancestry are none the less indications of physiological states of the organism at a given moment. The impulse of these forces are the individual's interests and indicate, in a delicate degree, fine adjustments within the organism beyond all power of any other kind. Moreover, as has already been briefly outlined, these interests pass through stages of development from impulse of muscular through reflex to interest in objects; a child's interest in certain forms of activity or even in certain objects is conditioned by the physiological stages through which this interest has been developed.

The attempt to apply the principle of interests to pedagogy must be attended with more care and critical inspection than has been applied in many of its applications. The evidence goes to show that children's interests have a wide arc in individuals; but, nevertheless, such mass studies as those of President Hall, Prof. Barnes and others, have undertaken with several thousand of children show beyond question that in certain lines at least, there exist generic interests, common to children of a given period of genetic development. The limits of this review are upon the generic side of interests, although it must be clearly borne in mind that there are included within the large generic arcs variable individual arcs, which must be considered by any teacher in the modification of any general course of study. While this principal interest may be attended with difficulties in application, while it may be shown that important exceptions under the rule must be made, nevertheless, viewed from this genetic standpoint, the principle of interest appeals as the safest general guide of what children should do with muscle and nerve adjustment in a nascent process of growth. Prof. Barnes thus clearly puts the issue: "We may say that the natural tendency in a child's development are right and to be encouraged; or we may hold that the natural promptings of human nature are wrong; that the aim of education is to divert the human soul from its natural course along some line determined by philosophy or theology. In either case, to act intelligently, we must know what the natural line of development is."

At this point the question which necessarily arises in the minds of those who have been trained to look upon the logical order as axiomatic in its declaration that a child must learn how to do a thing before doing it, is: How is the child going to draw if he is not taught by gradated steps of elementary simplicity? To the adult mind, steeped in this traditional dogma, this rises as an incomprehensible problem. It is the natural

view of the adult mind. But there is seemingly nothing incomprehensible about it to the child. The remarkable feature about children drawing is their absolute and unflinching courage and naïve self complacency, both with their ability to draw anything and everything they wish to draw and with what they have drawn. Passy (p. 615)[1] most vividly describes the attitude of a young child in drawing: "He does not hesitate but seizes his pencil and draws rapidly in an automatic manner. It is impossible to make him look at his model with any attention; if any one commands him to look at it, he hurriedly casts upon it a distracted and disdainful glance and continues without concerning himself with that which he sees. The moment he has finished, he shows it to you with a triumphant air."

Prof. Barnes in his study of 15,218 drawings by 6,303 children from 6 to 16 years, who were requested to illustrate the story of Hanns-Guck-In-die-Luft, finds that at 6 years of age, the children drew on an average 1.6 scenes; this average increased steadily until the boy, at 14, and girl, at 13, the average was a little more than 3 scenes each; from this time on, the average decreases and at 17 years was 2.4. Prof. Barnes comments: "This would seem to indicate that girls at 13 and boys at 14 become less daring in expression. The children who refuse to draw at all were over 13 years. Other studies in this line would seem to indicate that at 13, or the period of puberty, the children experience a change in ideals, and it may be that after this, they realize more fully, their inability to execute what they see."

O'Shea had a number of children draw from some object or person present and then from memory of some object or person well known to them. He reports: "While not one of the children up to nine years made any objection whatever I had to encourage those beyond that age to do the best they could and many of them seemed quite overpowered at first, especially in representing a boy or girl whom they could see. I noticed, also, that younger children rarely hesitated in drawing from memory, but go straight to work with their lines and dots to make man, woman, child, or other object, while the older children seem to be absorbed in meditation and do not draw so readily." In another experiment Prof. O'Shea had a number of children, from four to eleven years, illustrate stories which had been read to them, and they were given perfect freedom to express any difficulties which they met with. They were closely observed while the story was being read and during the making of the drawing. "From the records of five hundred cases

[1] Colonel Parker in "Talks on Pedagogics," p. 302, has a similar pen picture of child courage in drawing.

studied in this way about one per cent. indicated that they could not represent certain objects, among these being a bridge, a horse and carriage, and a fairy." At the same time, there was "no hesitancy in representing the wind, Jack Frost and other invisible things. It seems that with children of this age there are few objects ever seen or heard of that are too difficult for speedy and confident representation." Prof. O'Shea concludes: "It would seem, then, that children from four to nine years or thereabout, represent the object involved in drawing a story as readily and with as much pleasure as they would in repeating the story orally or even in listening to it. After the age of eight or nine, it seems that the difficulty of representing begins to be readily appreciated and there is less confidence and satisfaction in the work."

Dr. Lukens, in the course of his article, offers a number of individual illustrations of this principle of early courage of execution. A noteworthy one will be found on p. 92, *Pedagogical Seminary*, Vol. IV, in the case of five-year-old Tom, who, in the course of a year, struck off several hundred drawings, a partial list of the topics of which Dr. Lukens gives; they range over the whole field of child thought, from scenes of Jack the Giant Killer to the picture of a house on fire; no trace of a problem of ease or difficulty of mechanism is to be found.

In Prof. Brown's study there is offered some interesting data from children under five years showing that they did manifest lack of courage when called upon to draw from models before them, but this feature does not seem to appear in memory or pictorial drawings.

Certainly, nothing is more clearly evident than this, that children during the kindergarten and primary grades, allowed to choose their times and objects for drawing are not spontaneously worried about the problem of how to draw. The evidence is equally clear that there does later come a time when the child does become self-critical of his work, does hesitate, does need help and will seek it in the mechanism of expression. The criticism which genetic psychology would attach to the present system is not that it has taught mechanism too much but it has taught it at the wrong time; that the school curriculums have attempted to answer the child's question of how to draw several years before he has asked it or wants to know.

This subject of courage and confidence in the ability to draw bears upon the important problem of accuracy. Accuracy is the core and radiating center of the systems determined by the logical order. Text and teacher's hand books are sprinkled page by page with hints, rules and regulations for teaching and insisting upon accuracy—accuracy in line drawing, accuracy in perspective, accuracy in seeing, accuracy in representation of

the model—all of which go to show that the problem at best is a persistent one throughout the kindergarten and primary school. The child's pertinacity in carelessness as to accuracy, has only been equalled by the pedagogue's pertinacity in his attempt to force the child to be accurate. The physiological side of the problem has already been touched upon indicating that there is a strong basis and justification for this pertinacity on the child's side of the matter, and vital danger in the pedagogue's pertinacity. Probably the best objective corroboration of this physiological view lies in the evidence of the continual and monstrous effort to enforce it; further, after all, with the best of texts, devices and entreaties, punishment even to the rod, with the most conscientiously unmerciful teachers in the enforcement of this logical requirement and with the most obedient pupils, the drawings of young children who have lived through all this merciless drill until the drawing lesson has been associated in the minds of teachers and pupils with all that is disagreeable in school life, show little gain in the point of accuracy. Mrs. Maitland comments upon the drawings of several hundred children who had attempted geometric figures which they had learned to draw in school as follows: "In the conventionalized design where the aims to be attained are very definite, it is to be deplored that in this class of drawing where accuracy is a supreme virtue, inaccuracy and slovenliness are the conspicuous elements. The lines are often ruled, they are too long or too short, the angles are not true, the squares, circles, triangles, and sections are not true."

The spirit of texts and school curriculum under the logical order is typically illustrated by the view of Mr. Sparks, of South Kensington, quoted by Mr. Cooke: "The main thing (in the teaching of drawing) is to make children accurate; that is the moral of the whole thing. Some sentimental objections have been made to a hard and fast and repulsive method, but it is necessary to be very matter-of-fact in training artisans to be accurate in understanding any drawing that may come before them."

It is but too clearly evident that there is no ground of compromise between the logical order and the genetic view in the point of accuracy. Accuracy is a fundamental essential to the entire system and the fact that a child is inaccurate by nature becomes to the minds of system and curriculum makers the most mandatory reason in the world for the need of drill. The genetic conclusion is diametrically opposed; the fact that children are inaccurate and are not interested in accuracy is the very best evidence that they should not be forced in drills of accuracy; it indicates to the supporters of this view physiological causes; the child's hour for accuracy has not yet come. Until

it does come the pedagogue will be wise to lie abed and wait for the child to grow.

Probably the study most directly bearing upon the subjects for drawing best adapted from the standpoint of children's interest is that of Mrs. Louise Maitland. It comprises 1,050 drawings from public school children from six to seventeen years, 350 from eighteen children in the Stanford Experimental School, of five years and upward, besides a hundred or so more. It will be observed in the tables that in almost all of the rubrics a significant change of interest takes place about the 10th year. At five to seven years, 55 per cent., and at eight to ten years, 62 per cent. draw separate objects, and at eleven to thirteen years the percentage jumps to 91 per cent. and at fourteeen to seventeen years, to 98 per cent. Picture stories are preferred by 32 per cent. of children five to seven years, at eight to ten years by 33 per cent., but at eleven to thirteen years this ratio falls to 6 per cent., and at fourteen to seventeen years to 1 per cent. The same change at this period is to be noticed in their preferences for objects. The following table shows what children drew when asked to draw anything they pleased:

	5-7 yrs.	8-10 yrs.	11-13 yrs.	14-17 yrs.
Human figure	45%	40%	8%	5%
Animals	23	21	11	10
Plants	35	30	17	11
Houses	32	30	13	4
Mechanical inventions	8	13	11	8
Still life	40	47	39	31
Geometric design	5	12	28	37
Ornament	3	3	4	8

Significant facts to be observed in relation to the logical order are that the human figure, which comes last in the scheme of the logical order, comes first in the order of genetic interest, and that interest in animals, plants and houses, which the logical order also would put last, are shown to have their larger ends of spontaneoue interest in childhood, tapering with increase of age. On the other hand, geometric design and ornament, which are exclusively the warp and woof under existing systems, show an almost inappreciable interest in children uuder 10 years, but become important after that period. It must be remembered in this connection that probably the larger number of these children receive instruction in geometric design in the public schools.

Dr. Lukens's study of twelve hundred and thirty-two spontaneous drawings of children under ten years, corroborates Mrs. Maitland's figures. He finds that 44 per cent. of the whole number are drawings of the human figure, and if he should

base the estimate upon drawings which contain the human figure (which would include pictorial drawings) the percentage would be 75. Geometric figures and ornament combined were significantly represented by only 2 per cent. He concludes that the thing par excellence for all lower grades and kindergartens is the human figure and from the date of his investigation forcibly condemns the prevalent use of geometric form.

Ricci's study of 1,250 drawings is wholly upon the human figure.

Studies under the direction of Prof. Brown deal almost exclusively with the human figure, broadening to objects with which the child is brought in contact in his natural experience, mainly animals, houses and actions. Prof. Brown says: "It seems clear that the first drawings of all these children was pictorial rather than decorative in character. The idea of making symmetrical figures for the mere sake of beauty was a later development if it appeared at all."

By Prof. Barnes's table of 15,218 drawings, it would be indicated that the human figure in different attitudes occur in every drawing; but here his subject, the story of Hanns-Guck-in-die-Luft, will of course encourage such a result.

Sully's elaborate study reaches the same conclusion. He says, the human figure comes first in the child's interest in drawing and animals closely follow.

The second class of material which the systems give largely after geometric figures, is decoration and design, which grow with clear logic from the arrangement of geometric figures. It forms a large part of the form and drawing lesson in the kindergarten and primary school. It is supposed to cultivate an artistic taste and appreciation. The results in this field are as unanimous as in the former case. Mrs. Maitland, as stated, finds that from five to seven years 5 per cent. draw designs and 3 per cent. ornaments and this ratio increases to the ages of fourteen to seventeen when 37 per cent. prefer conventional designs and 8 per cent. ornament. Dr. Lukens finds that under ten years of age 2 per cent. covers geometric design and ornament combined. Prof. Barnes remarks that out of the 15,218 drawings not more than ten or twelve papers are decorated in any way with borders or ornamental lines or fancy flourishes. Prof. O'Shea placed before groups of children, five to seventeen years, a chair or table which was ornamented. He says: "With children of five, the ornamentation was never represented; with children of eight, exactly 50 per cent. of the drawings showed evidence that their authors had tried to reproduce the ornamentation, while with persons of sixteen, 87 per cent. represented the objects ornamented." Ricci sums up his study of the question with the sentence, "Art as art to children is unknown."

He finds that drawing is merely a language to young children and their zeal is put forth in symbolizing all there is in their minds. Sully says (p. 382), "At no stage in this child art can we find what we regard as elements of artistic value." However, in these statements, it is but just to state that nearly all explain that by concluding that children have no art in their drawings they do not mean to imply that the child has no art in his nature. Sully, for example, emphasizes the art impulse in the child nature. "We are quite justified," he says, "in speaking of the art impulse as a common characteristic of childhood." But in the early stages of these drawings under consideration, art does not seem to have reached a stage ready for expression in form.[1]

The only observations throwing light in any sense of exception to what has preceded are those of Miss Shinn,[2] chronicled in her Notes. The child was given the Froebellian gifts in the second year and a careful effort made to educate the child with them. At times, as the notes show, the child took a warm in-

[1] Other investigations of child nature which have no place in this review are strongly pointing to the suggestion that we are acquiring altogether too much expression from the child in certain lines. Much of his nature and much that is strongest lies as yet in the form of vague instincts and below the threshold of consciousness. To this class of feelings, as it were, the art instinct properly belongs; while the child may be said to be strongly animated by instincts which will develop into artistic powers, it 's an altogether different matter to assert that he is ready to stand and deliver these in the form of language, in form acceptable to the schoolmaster. Heim, in his Zeichnen und Schen (p. 16), strongly inveighs against the emphasis placed upon ornamentation in early education. He points out on utilitarian grounds that it is only a very small part even of æsthetic appreciation among adults that depends upon ornamentation. A true sense of art, he says, only comes from the irregular forms of nature and these tend strongly to excite the child and should be the material for educating his artistic impulse.

[2] In a letter to the writer, discussing this point, Miss Shinn says, "the interest in type form did not last after the identification of them had lost its novelty. Ruth is now six years and a quarter. She uses her knowledge of the plane forms as she does that of any ordinary fact —as we do; that is, she would refer to a square tile or an elliptical garden plot merely to describe them as she would a tall tree or a white flower. The form is not a feature that interests her especially, and unless she found it necessary to bring it in, she would not be apt to mention it in a description. Solid form she never mentioned of her own accord, though she knows whether a thing is a sphere, a cube or cylinder. . . . I made a good deal of effort in the third year to follow the Froebellian method—with signal ill success. The child utterly declined to be the child of Froebel and detested all that Froebellianism assures us the child loves and found easy all that it tells us is hard. This was also the observation of the other college women in our seminary. . . . . On the whole, I found better adapted to the child's nature and entry into education by the door of literature rather than mathematics."

terest in them; her first drawings were of the geometric forms though at so early a period (under two years of age) as to suggest the probability that the interest was merely muscular. Later observations go far to vitiate the significance of the earlier observations.

The principle of a generic order in the selection of features first drawn in the representation of the human form, which has received some attention from Dr. Hall and Professors Barnes and Sully,[1] indicate that the child tends first to draw the face and ends with the body and neck. The cause of this fact is, doubtless, that babies first distinguish as objects the human face and its expression by the eyes and mouth, as Preyer has shown. It indicates that the visual centers gain control of the arm movements in drawing the human figure in the order of the parts most often seen and which are, for practical purposes, most interesting. The human face, its eyes and mouth are early matters of interest to the child, while the body and neck come after the arms and legs in point of practical interest. The pedagogical conclusion would reinforce that already suggested, that the first objects in drawing should be those with which the child has been most intensely interested in his daily experiences and in a practical way. Abstract geometric forms the child can, of course, be made to look at, but this is altogether another thing from making him see them with such intensity under the complex physiological conditions which build up visual centers in the nervous system capable of control of intricate arm and hand muscles.

The force of these foregoing studies upon what subjects are most interesting to children for drawing purposes, made upon thousands of children of America, England, and as well in sunny Italy where art has had its abiding place for centuries, is clearly in conflict with the dogma of the logical order which would reverse the steps in learning to draw which these studies suggest. They indicate that the interest in the human figure and human affairs, irradiating to the things with which the child deals in his daily experience, is generic. The human figure, which in the logical order comes last, and in the adolescent period comes in the genetic order with the babe in his crib, and, so far as this data would suggest, interest proceeds toward and not from the logical geometric simples. The pedagogical inference, in the language of Dr. Hall, is that the present system should be stood on its head. It is probably misleading to say the child is interested in drawing the human figure. That im-

[1] G. Stanley Hall: *Pedagogical Seminary*, I, p. 166. Earl Barnes: *Pedagogical Seminary*, II, p. 460. Sully: Studies in Childhood, p. 337, *et seq.*

plies an art interest, for art's sake, which is clearly not the case. The child is a human egoist and his interest naturally centers around himself, man and what man does or can do in daily child experience of sight and action. Ricci succinctly expresses the point when he says: "Children by drawing describe man and things instead of rendering them artistically. The child tries to reproduce man in his literal completeness and not according to visual impression. They make, in short, just such a description by drawing as they would make in words." In the child's sphere of ideas the beginning and center is man's activity and this interest irradiates. Drawing as an expression of these irradiating ideas—just as speech, and later, writing are—must in consequence follow along the lines of this diffusing interest.

III. Psychological Inaccuracies.

There is a class of inaccuracies which are not clearly dependent upon the coarser and more fundamentally physiological conditions. To avoid any question of dispute, they may be classified as psychological, not, however, with the implication that they have no physiologically causal dependence.

(a) The child misplaces parts of a figure indicating that his visual centers are not in such firm control that they can continuously hold the attention to the object as a whole. Miss Shinn's niece, for example, puts in a drawing a little girl in one corner and her dress in another, both hands on one side and her mittens quite away from the hands. It is quite a frequent thing to find the eyes placed outside of the head or the arms or legs detached. All observers mention this. Sully remarks that it is astonishing what a small child can do in the way of dislocating and putting things in the wrong place. This feature is most strongly represented in the earlier period and many examples will be found in the illustrations printed in the articles of Sully, Lukens, Cooke and Brown. Passy remarks: "One might say that children exaggerate details; it would be more exact to say that they draw without consideration of the whole; in reality *l'ensemble* does not exist for them; one can best define the drawing of a child as a collection of impressions more or less disparate; each part is drawn without regard to relation." That this feature persists till late is shown by the fact that Professor Barnes who studied deals with children over six years of age places considerable emphasis upon it.

While the exact psychological import is not clear in detail it is sufficiently plain that it is a sign of an immature condition of control by visual centers.

(b) After a child has learned to draw some object or part of one, he tends to use this scheme as a conventional form, as

it were, in the drawings of all objects or parts which in any way suggest it. Professor Baldwin's little girl, after learning to draw the human figure, would put arms on a bird. We thus find tendencies to put human faces on animals' bodies or to draw an animal as a man on all fours. In the grosser forms of this feature, the child neglects to look at any special attitude, but, as Passy says, mechanically reproduces the conventional form which he has habitually associated with it; thus having learned to draw the figure of a man in one certain position, the child uses this conventional form for man in any position. Passy and O'Shea posed as model in various attitudes, both full face and profile, before classes of pupils. O'Shea's results, with which Passy is in agreement, is that in no matter what position the model stood, the same picture grew under the artist's hand, as he had made it perhaps hundreds of times before. Children who made front views would make them when the model was in profile. This refers to children under ten years of age. "But it seems different with older children," says Professor O'Shea, "I have been unable to get those above ten years to represent readily a person whom they could look at and who stood in a different position from what they had been accustomed to represent in their drawings." Another experiment to discover whether certain conventional types are carried for a long time, Professor O'Shea examined the drawings of a class throughout the period of over a year; on an average one hundred and fifty drawings were made by each child and the persistence was clear. Some children always show roots of trees, have always the feet of the human figure turned in opposite directions, always have the clothing showing buttons, etc.

The psychology of this feature indicates the law of strong muscular association that any act once performed in a certain way tends to repeat itself unless inhibited. The inhibition in this case must of course come from the eye perceptions of the model. The fact that the eye does not interfere clearly indicates the immaturity of the visual centers and further that muscular associations are powerful where this anachronism occurs.

(c) Closely allied with the foregoing is another tendency which has caused much discussion and is universally admitted. It is that children under the tenth year, at least, tend to draw what they know about an object, not merely what their eye at a given moment, in the study of a given model, sees. They draw both sides of a house, or the inside of it, from an external view, two eyes in a profile face, or will turn over a profile picture to find the other eye, make the farther leg of a man on horseback show through the sides of a horse, picture the stomachs and lungs in human figures and feet within shoes. Clearly, before anything can be done in perspective from a logical stand-

point, this error must be corrected. Consequently, in the systems, immense efforts are constantly put forth to meet this difficulty even at a very early age and writers from this standpoint, in teachers' manuals, have made the expression, "Draw what you see," the shibboleth of drawing instruction.

The most direct and valuable study upon perspective is that by Mr. Arthur B. Clark (in Studies in Education, No. VIII). It contains illustrations and charts showing the development by ages in the power of perspective. A most important principle which Mr. Clark urges is that there is a progressive ability to see and draw perspective effects according to age whether or not children receive special instruction; that it is a matter dependent upon age and development rather than upon instruction. Mr. Clark stuck a large hat pin through an apple and asked 408 children, ranging in age from 6 to 16 years, to draw it. "With two or three exceptions," he says, "it was drawn in but three ways; 137 drew it clear across the apple (*i. e.* drawing that which they could not see); 150 drew the pin to the edges of the apple; and 121 drew the complete, perspective effect." An accompanying chart shows that in the order of age ninety-eight per cent. of the children of six years drew the pin through the apple (*i e.*, drew what they knew, not what they saw); the curve decreases gradually until at nine years only 40 per cent. drew it in this way, 40 per cent. drew it to the outline and 20 per cent. drew the perspectivce orrectly. At ten years, the number who drew what they knew falls off almost perpendicularly and at 14 years, there are none who do not make some effort to draw what they see. The curve for true perspective effect begins with 2 per cent. at six years and gradually increases, reaching thirty per cent. at ten years and fifty-eight per cent. at sixteen. Books laid upon a table for these children to draw show results in chart form practically identical with the foregoing. This study taken by itself would indicate that the average child should have extremely simple perspective problems until the ninth year, if any at all, but after that age, certainly, the great majority try to draw what they see and consequently the time for special instruction has come.

Barnes collated 12,740 human faces drawn by children; at six years twice as many full faces were drawn as profiles; from six to thirteen years, full faces decreased and profiles increased and at thirteen there were twice as many profiles as full faces. The number drawn of each was equal at a point between nine and ten years. Barnes comments: "This may mean simply that after nine years the child tries to really represent the face and then the profiles are easier. If this be true, it helps us to locate the point in the child's development where he begins to represent things as they really are instead of diagrammatically,

and nine years would seem to be the age at which the grammar of drawing might be introduced."

Sully finds that the profile is the natural symbol of the human face used by children up to five years of age. Dr. Hall finds that out of 44 heads drawn by children entering school only nine are in profile. It will be remembered in the experiment of Prof. O'Shea, already quoted, that children under ten show little hesitancy in drawing anything, regardless of model or memory, while those over that age tend to hesitate and feel embarrassed.

The psychology of this feature, carrying out Baldwin's general explanation, indicates the inability of the visual center completely to control the drawing movements, and that associations muscular, and other, continually interrupt this control by the visual centers; that other ideas in association with the visual centres are really stronger than these and seize the motor apparatus so that the child draws by the control of centers, represented by ideas he has about the object. In the apt language of Ricci, the child's drawing tries to express just such a description as he would make in words. It is clear that the conventionalizing tendency and the tendency to draw all that is known offer most serious obstacles, while they continue dominant, to instruction in drawing according to the logical order. Until this difficulty is overcome, little can be done in the matter of exact and accurate form study. The studies strongly indicate that the average child does not reach this period normally until the ninth or tenth year. Effort to force the child in this matter would, from the genetic standpoint, be injurious. The upholders of this latter view are inclined to maintain that drawing up to this age is not art, is not representation, is not even form study—it is a language to express any and all ideas of child life.

Sully, Hall and Passy draw a very close parallel between the figures of children's development in drawing with the development of similar instincts in the race, to which the reader is referred for details. All of the chief fallacies and anachronisms of children's drawings are found in the drawings of primitive man and primitive man for centuries used grotesque symbols barely representative as a means of writing, of expressing ideas. This view of such a period in the development of art is in full accordance with Hegel's theory in his Philosophy of Æsthetics though from an entirely different philosophical basis. He divides art development historically into symbolic, classic and Christian. The symbolic period was that of savagery when man did not conceive the idea of representation and his drawings were vague and bizarre; he expressed power by great size or multiplicity of limbs, heads, etc., without much

evidence of representative attempt. In the classic age of Greece, the expression was fully adequate to the idea and representation reached its height. The analogy of these children's drawings with this symbolic period is clear.

The significant feature for pedagogy, illustrated by these cases is, that drawing of children up to nine or ten years stands on the level of writing; by it he expresses any ideas that he might express by words; while not exactly symbolic in the strict sense of the word, it is more symbolic than representative[1]. It is only later that the child tends to limit drawing to the expression of ideas of accurate form. The genetic view does not dispute the logical view as to the necessity for drawing what is visually seen, but asserts that in the present systems this work has been put several years too early and protests against the forced methods which have necessarily been used to compel the child to do that which he is not ready to do.

A serious objection arises necessarily, upon the suggestion that the systematic instruction by the logical order be postponed at least until after the ninth or tenth year, that there will not be then time to teach the subject in the remaining school course. This objection in its naked form is certainly a forcible one, and one that the upholders of the genetic view are not yet prepared to meet with a definite plan; it has not yet been tried. The answer, however, would probably be along some such line as follows. The replacing of the systems of drawings upon the logical order by a system based on the genetic order does not mean that there would be no drawing instruction in the kindergarten and primary grades. In the reorganization of matter, methods, and system, the child's interest probably would require more attention to the subject than at present. So far as the mastery of accuracy and ideas of geometric form are concerned, there is every reason to feel confident that these would be more quickly and readily acquired at a period when the child has a strong, instinctive interest in them than at a period when he has not. We are all ready to grant that nothing would be gained and much lost should we attempt to teach babes to walk before their natural period for walking; stunting and permanent

[1] As Professor Brown and Miss Shinn point out, the word "symbol" is hardly the best word to use in this connection. It is clear that the child himself does not as a rule consider his drawings merely as "standing for" the object. It is ever, more or less, a representation from the child's standpoint. But in the sense in which Hegel used the term, the savages were equally confident that their rude drawings were not like the object. So probably the term "symbolic" in its Hegelian significance will do as well as any as an expression to denote drawings from general ideas not limited merely to those referring to exactly what the child sees, but including, as well, what he knows.

injury probably would be the only result and no time would be gained.

To recapitulate, the progress of a child learning to draw is roughly divisible into three genetic periods, although it must, of course, be kept in mind that there is no definite point of change.

1. A period in which the movements are wholly muscular and are unguided by the visual centers in any degree; roughly, this period is that of the second and third years.

2. A period roughly between the fourth year and the ninth or tenth, characterized by the first beginning of crude representation and slowly proceeding toward an interest to accurate drawing of objects as they are really seen. During this period, the visual centers show evidences of extreme instability to control the delicate muscles of the arm, hand and fingers which must be presumed to be coming into functional existence throughout this period.

3. A period beginning with an interest in accurate representation of what the eye sees to the exclusion of associated ideas.

This review has dealt only with the first two periods.

To sum up and place the problem of education involved in the clear light of contrast from the standpoints of the logical and genetic views, the use of parallel columns may be suggestive. It is to be understood the term "child" is not used beyond the ninth or tenth year.

THE LOGICAL ORDER.	THE GENETIC ORDER.
The child's mind is a *tabula rasa* upon which anything considered by the educator desirable may be written at the will of the educator. It is the business of the educator to select and write the knowledge most desirable and in an order determined by a logical analysis of the subject.	The mind of a child shows, in some fields at least, which have been investigated, distinct generic tendencies to select certain material and methods for its education and reject other material and methods. It is the business of the educator to make use of these generic tendencies as interests and to subordinate instruction to them.
Childhood should be shortened to its lowest possible limits and as rapidly as possible the child should be induced to put away childish things.	Investigations point to the probability that the child who is most the child, as a child, will be most the man, as a man; therefore let childhood ripen in children.
The child is a little adult. If we take cross sections of the human mind at various	The child is not a little adult. Investigation indicates that he grows in spots. Cross

levels from birth to adult life we shall find that the ways of thinking are identical in kind and character.

The steps by which a child learns a body of knowledge or training, as, for example, accurately to represent in drawing, are identical with the processes by which a full grown man logically thinks them.

The determining principle in forming a course of study in drawing should be that of the synthetic combination of the parts obtained by analysis of the subject matter concerned, in a logical way, according to inherent relations existing between these parts.

These parts thus obtained by analysis will be the abstract geometrical simples of form divorced from all matter or distracting ideas and these the child should be taught to recombine and finally he may be led to natural objects in which both matter and form appear.

The child should be taught fully and completely the mechanism of how to draw before he is allowed to draw from his own ideas.

The first essential step in sections show changes, in kind, in the ways of thinking though these successive layers show causal relations, one with another, just as, while the bud is not a leaf, yet there is a causal relation between the two, and healthy and mature functioning of the bud is essential to the best activity of the leaf.

In certain essential respects, at least, there is evidence to show that the steps by which a child learns to represent in drawing are radically different from the processes by which a full grown adult thinks them.

The determining principle in forming a course of study in drawing must be that of the child's generic tendencies or interests, modified by individual interests. Investigation indicates that these interests require an order of instruction more nearly the reverse of the logical order than identical with it.

The child's generic interest shows that he should commence drawing with man and the things that men do or have about them—the human figure, the house he lives in, animals he sees or fears. Matter and form are therefore inseparable in childhood and the progress is toward a separation; hence, abstract geometric forms will come last, not first.

The child should be allowed to draw from ideas and in doing so, and under the influence of the interested excited mechanism should appear as a subordinate factor.

Accuracy is a power depend-

drawing is that of accuracy, for this is the prime requisite of mechanism. All success will depend upon forcing the child into habits of accuracy of sight and movement.

ent upon physiological maturity; the first consideration should be prevention of physiological injury; the time for drill and accuracy is indicated by the time interest develops in it. By reversing the relative order of mechanics and drawing from ideas, the essential place of accuracy is also reversed.

Drawing should originate and cultivate artistic instincts.

Instincts cannot be originated. They are probably determined for us by ancestral tendencies and have a genetic order of development in the individual. The child shows practically little of what is ordinarily meant by artistic instinct and it is not ready for formal expression.

The material best suited for originating art instinct consists of the dislocated parts of conventional designs and the typical geometrical forms divested of all that would interest the child and thereby distract his attention.

The child has practically no interest in conventional designs nor in abstract geometrical forms; such instruction should at least be postponed.

Drawing to the child should be made to deal with form exclusively.

Drawing to the child is language for the expression of his ideas; and form, pure and simple, constitutes a very small modicum in his interest. It is not possible to segregate form in the child's mind in an intelligent manner to him.

ORIGIN AND DEVELOPMENT OF HOME AND LOVE OF HOME.

By L. D. ARNETT, Fellow in Clark University.

The object of this study is to set forth some of the conditions of the care and provision for offspring and to follow out, in a general way, the widening stream of interest in the welfare of progeny as shown by any preparation of the parents for them. This presupposes in a general way what is meant by home. Home in general, and in the wide sense of the word, is the place where offspring are born and pass through the stage of helplessness to that degree of maturity whereby they are able to gain their own subsistence. It centers around the spot selected by the mother and on her precision, erring or unerring, depends the continuation of the species. The conditions of the environment necessary for the life of the protozoa are comparatively simple. The short period of birth, if it may be so called, since the two organisms produced[1] are exactly similar, except in size, to the parent, renders the food of the parent suitable for the offspring. The environment in which the parent thrives well is especially suited to rapid multiplication of offspring.

A few instances may be noted where eggs are even deposited, apparently, without any provision on the part of the animal as to the future of its species, yet nature in her workings is not prolix, and the law of parsimony is everywhere predominant. Many insects deposit their eggs where they feed because their larvæ are able to feed on the same. Brauer's Classification is based on the similarity or dissimilarity of the food of the larva and imago.

The vast body of life of the ocean is one in which the different forms are ceaselessly feeding on one another. It is a basin of food, of which the countless offspring are evidence. Among the vast majority of its life the offspring can subsist beside the parent, and the one condition necessary is, that the number is great enough that one, of each sex, out of the 9,000,000 eggs laid by the cod,[2] for example, may reach the procreation period. The monotony and density of marine life,

[1] Balfour: Comp. Embryology, p. 7.
[2] Günther: The Study of Fishes, p. 160.

save for the effort to escape being destroyed, is so great that the least limited sphere of activity and neurotic development is called forth.

Some Conditions Fundamental to Nest-Building. The selection of some particular place for the eggs, and especially the concealment of them in some way from enemies marks a great advance. The long journey of the salmon from the sea, costing the adult its life, shows how necessary it is for the eggs to be deposited in their proper place and what a sacrifice the individual makes for the species. Insects have a great advantage over some other species in the amount of food. While some of them thrive on special plants others have a variety of foods. The common nettle[1] is fed upon by thirty distinct species of insects while the cabbage furnishes food for two hundred different kinds. The great mantle of green herbage, almost without distinction, furnishes food for some of the larval forms. Among the lepidoptera, where the eggs are very numerous, Sharp[2] thinks they are discharged almost at random in suitable spots, but moths such as the Clesiocampa neustria fasten their eggs around the stem of the food plant in a very perfect and artistic manner. He says, that some of the butterflies seem to prefer to oviposit by placing an egg here and there and do not seem to risk many in one situation. Trouvelot noticed, in his study of the silk worm (Telea), that while the moths laid their eggs on the leaves and twigs, that they were sometimes laid on plants which the larvæ refused to eat, and, since there was none near on which they could feed, they perished. The color of the egg is a means of protection, and its value for that purpose depends largely on the environment. This is noted most strikingly among birds. In his study of life forms Erasmus Darwin[4] observed that "the eggs of hedge-birds are greenish with dark spots; those of larks and partridges are russet or brown, like their nests or situations." Poulton[5] thinks that a process of natural selection has brought the change in color of birds' eggs from the original whiteness of the serpent. Unconcealed eggs are almost invariably colored or marked in some way, while with concealed eggs natural selection has ceased to work and if they have been of a different color they have reverted to the original. The colors of the eggs of the barnyard fowl may be cited as an instance of

[1] Badenoch: Romance of The Insect World, p. 39. (*Note.* This estimate of the insects living off the cabbage plant includes those that feed on the cabbage parasites.)
[2] Camb. Nat. Hist., Vol. VI, p. 322.
[3] American Nat., Vol. I. Silkworms.
[4] Zoonomia, Vol. I, p. 510.
[5] The Colors of Animals, p. 62, *seq.*

the slow reversion from the brown color of the egg of the jungle fowl to the white color. Whether surrounding objects can affect the color of the eggs has not been definitely determined. The formation[1] of the shell and the deposition of the pigment forming the markings is a process usually referable to the walls of the oviduct, and is related to the pigments of the blood and bile. For some influence birds have been known[2] to vary the color of their eggs. Erasmus Darwin[3] thought that it was due to the imagination of the female while others have thought that the nervous system is the direct medium through which the environment acts.

The safety of the egg is further ensured by many animals against extremes of temperature. Like the germination of the seed, a certain temperature must be maintained for a definite time to set in motion the rhythmic action of life. The migration of fish to their spawning ground is thought to be excited by the approach of the temperature of the water towards a limit that is favorable for the hatching of the eggs. The change[4] may be an approach toward warming or toward cooling water. Too cold temperature delays hatching, and as they lie open to the attacks of enemies the chances of their hatching and reaching maturity is lessened. Insects usually place their eggs where they will not be affected by the scorching rays of the sun.

An example of the economy of nature is found in the adjustment of the food stored up in the egg case to develop the fertilized ova. Without any waste the food is just sufficient for development to a stage where some other method of getting nutriment is already provided. Gadow[5] says that as a rule "the greater the amount of yolk the smaller the number of eggs produced." The yolk-glands of the eggs of the lowest worms[6] represent a degenerate portion of the ovary. In these the cells have become more highly nutritive than ova. Gegenbauer thinks that the origin of the yolk-gland is probably to be found in the division of labor of a primitively very large ovary.

The yolk is a store of food collected around the ova, to a greater or less extent from the germinal epithelium of which it is originally a part. For most[7] animals this forms a large part of the stored up food. Another source of supply in

[1] Geddes and Thomson: Evolution of Sex, p. 104.
[2] Nature. Vol. VI, p. 547.
[3] *Op. cit.*, p. 511.
[4] Report U. S. Fish Com., 1876, p. 507.
[5] Camb. Nat. Hist., Vol. VII, p. 53.
[6] Geddes and Thomson: Evolution of Sex, p. 61.
[7] Hadden: Study of Embryology, p. 5.

some animals is found where the primitive ova feed upon its neighboring germ cells. This method of storing up is characteristic of some Hydrozoa, insects, etc. A third source, found among many of the lower worms, represents the degenerate ovary. These cells collect about the ovule and form a future store of food.

The quantity of food thus stored up about the ova is characteristic of the species and is adjusted to the later stages of food and growth. Where no future provision of care is destined by the parent proximity to its future pabulum is essential. The insect world is dependent to a very great extent on the certainty of the larvæ finding the proper food. Yet this store is so great that the risk may be small. Of the vegetable feeders, even if many are illy placed for food, the chances are always in favor of the great majority surviving. Wallace[1] noticed instances of misguided selection among the insects of the Malay Archipelago.

Some of the Ptilenus find their life-long food in decaying or dry wood fiber, and this condition may even be produced by insects for their young. The Hickory[2] girder, one of the Longicorn beetles, cuts a groove about one-tenth of an inch wide and the same depth around the young shoot just below where the egg is deposited.

Most of the vegetable feeders among the insects prefer the living fiber. Gall flies,[3] for instance, deposit their eggs in the living tissue of the leaf or stem and the resulting excrescences are due to larval irritation. Weismann[4] mentions the description of an insect (Rhodites rosæ) depositing her eggs in the tissue of a young bud. He says that "she first carefully examines the bud on all sides and feels it with her legs and antennæ. Then she slowly inserts her long ovipositor between the closely rolled leaves of the bud, but if it does not reach exactly the right spot she will withdraw and insert it many times, until at length when the proper place has been found she will slowly bore deep into the very center of the bud, so that the egg will reach the exact spot where the necessary conditions for the development alone exist."

Insects that feed upon animal tissue are more limited in their supply of food. Decomposing animal matter is a spot selected for the larvæ of the blue meat-fly.

The different kinds of solitary wasps store up their provision in order that it may be ready for the larvæ. Other insects pass their entire existence inside their carnal food.

---

[1] Malay Archipelago, p. 365
[2] Pop. Science Mo., Vol. XXVI, p. 695.
[3] Hyatt: Insecta, p. 233.
[4] Weismann on Heredity, p. 94.

Reaumur[1] experimented on the meat-fly by placing one in a vase with a piece of fresh meat. The irregular heaps of eggs at different places on the meat amounted to about 200 and were deposited in less than half a day. In less than twenty-four hours the larvæ hatched and began their work of burrowing into their food.

Loeb[2] made some studies on the attraction of the fly to particular kinds of meat. He came to the conclusion that the guiding influences are tropic in effect, and the excitation is caused by the effluvia of the particular kind of meat. The fly turns toward this larder from a cause not unlike the moth flying into the flame.

Living tissue as a dwelling place for animals, especially under the head of parasitism, has attracted no small amount of attention. It represents a kind of animal world within itself. Cobbold[3] regards the entozoa collectively as forming a special fauna, whose "territory is the wide-spread domain of the interior of the bodies of man and animals." Parasitism in general is attended by degeneration. The structure of the body while in its early stage may represent a higher place in nature and a more complex organism, but their quiescent manner of life permits the atrophy of unused organs. The food is easily obtained and it is often in a form of ready assimilation. The only class of parasites to be considered in this study are those in which the young at least are parasitic. An example of this class, frequently observed is the Ichneumon fly. The imago of this species has one object in life and that is to find some larva on which to deposit her eggs. Thomson[4] mentions one that was observed to remain under water twelve hours, adopting a new medium for living and using her wings for oars, in search of some particular larval form. Another species[5] (Black Thalessa) bores into the hard wood to deposit her egg in the burrow of the Tremex. With no mark to guide the human eye she locates the spot where her long ovipositor may penerate the burrow of the larva and is thus able to carry on her species. So general is the warfare carried on by the Ichneumon family that no less than thirty-five species direct their attack on one of the Bombyx moths. The female of the Scolea,[6] another of the Hymenoptera, penetrates into the ground in August or September in search of the larvæ of the Cetonia. When a suitable larva is found she stings it suffi-

[1] Figuier: The Insect World, p. 76.
[2] Physiology of the Brain, pp. 186-188.
[3] Parasites, p. 2.
[4] Studies in Animal Life, p. 109.
[5] Hodge: Nature Study and Life, p. 247.
[6] Van Beneden: Animal Parasitism and Messmates, p. 165.

ciently to paralyze it, but not severely enough to kill, and deposits her eggs on the ventral surface. As soon as the larva is hatched it penetrates into its larder and gradually consumes it until only the skin of the empty Cetonia remains. The Botfly is another example of larval parasitism. "Guided by a marvellous instinct," says Figuier,[1] "the female Oestrus generally places her eggs on those parts of the horse's body which can be most easily touched with the tongue, that is, at the inner part of the knees, on the shoulders, and rarely on the outer part of the mane." A further refinement is carried out by some insects to the extent of making the egg itself a larder. Insect parasitism is most favored by the minute size of the animal. The short duration of life of the adult tends to confine its destructive influence chiefly to that of larval forms.

The refinely adapted ovipositor is no small vantage favoring the safety of young. In the struggle for existence the egg must be so placed that the helpless young will find the proper food at the exact time, and oftentimes it is of consequence at what place the young begin work on their larder. It is also significant that the ovipositor is often associated with the organ of defence, as though the fatal blow had something to do with the placing of the egg. Among the Hymenoptera the ovipositor is transformed into the sting. In the Saw-flies[2] it is used for cutting holes in the leaves, in which the eggs are deposited. In the Horntail[3] it is a borer attached near the middle of the lower side of the abdomen and "consists of a long, pointed implement encased in horny sheaths." In the Ichneumon (Thalessa astrata) it is a long borer and it is protected by two sheaths which unite to form a tube. It is used by the grasshopper to scoop out the hole in the hard ground in which the female lays her cluster of eggs. A somewhat different adaptation is made by the weevil in using its stiff proboscis for boring. Many instances might be given, in each case of which there is an almost perfect adjustment of the ovipositor to the mode of life of the species. Through the process of natural selection the delicacy of the arrangement of this instrument has to a certain extent taken the place of care by the adult insect. Generation after generation have been produced and the structural development has reached such a stage that the nervous structure responds mechanically to the proper stimulus. Thomson[4] says if we wish to explain insect life we must think back over the development of the species. It is quite possible if we had the steps of development much of the mystery would disappear.

---

[1] The Insect World, p. 60.
[2] Hyatt: Insecta, p. 231.
[3] *Ibid.*, p. 233.
[4] Studies of Animal Life, p. 108.

Traces of Interest in Eggs. In the previous section the object has been to present the simplest forms of interest in the welfare of progeny. In the lower forms of life the process of egg-laying can be little less than a reflex in response to favorable environment. No doubt the first traces of the care of eggs is the result of a structural arrangement and as such has gradually been developed in response to its need. The female Cyclops[1] carries her eggs in an external pair of ova-sacs. The female lobster is provided with two leaf-like swimmerets to which the eggs are attached. During the breeding season these swimmerets are covered with a sticky substance which glues the eggs fast until they hatch. Espinas in his studies of animals has noted that the first care on the part of the parent is the female. She alone exercises this, where it is present among the crustacea and insects. While care by the male begins among the fishes and can be traced to a varying degree through the orders of amphibia and birds. Among the Siluroid[2] family of fishes the female Aspredo carries the eggs in the soft integument on the lower part of the body.

At the time of propagation the integuments of the lower side of the trunk assume a soft and spongy texture. After the eggs have been deposited by lying over them she attaches them to her and presses them into the soft parts. When the eggs have hatched the abdomen becomes smooth again. For another member of the same family of fishes, the Solenostoma, the ventral fins coalesce with the soft integument and form a pouch for carrying the eggs. Long filaments line the inner side of this sack as a further precaution for the retention of the eggs. [3] Interest in the welfare of the eggs is much more frequent in the male than the female among fishes, and the line of protection is generally some method of carrying them. Among the pipe[4] fish, the Siphonostoma, the cutaneous folds of the tail form a broad pouch; for the Doryichthys dilated parts of the abdomen form a groove; for the Nerophis the integument of the abdomen is softened in the male and serves for attachment; for the Hippocampus, a sack at the base of the tail encloses the eggs.

In some species of Arius[5] the eggs are carried in the pharynx. Among amphibia there are similar adaptations. The ova is placed by the male on the back of the female Surinam toad, where the softened integument forms a receptacle. The male,[6] Alytes obstetricans carries the eggs entwined about his

[1] Nicholson: Manual of Zoölogy, p. 340.
[2] Günther: The Study of Fishes, p. 160.
[3] Günther: *Ibid.*, p. 160.
[4] Parker: Mammalian Descent, p. 85-86.
[5] Geddes and Thomson: Evolution of Sex, p. 255. [6] *Ibid.*, p. 87.

hind legs and retreats to a burrow for safety, coming out at night in search of food. He may even give his unborn wards a bath occasionally to ensure their safe hatching. Near the time when the young tadpoles come forth he betakes himself to the water. A part of Boulenger's[1] Summary will shorten detailed examples: Eggs are carried by parents:

A—by male. 1, round the legs; Alytes. 2, in vocal sacks; Rhinoderma.

B—by female. 1, attached to belly; Rhocophorus reticulates. 2, attached to back; Pipa. 3, in "dorsal" pouch; different species of Notrotrema.

In his discussion as to the origin of care on the part of the male, Espinas thinks that it is a widening out of the interest displayed by the female; and for the fishes he sums it up by saying that: "The father[2] feels an interest in the fertilized eggs because he regards them as a part of his own body; he cares for them because he knows that they are alive." The latter statement however might be questioned. Interest in the welfare of the ova is expressed in other ways. The male stickleback watches carefully over his nest, and keeps the water in gentle motion for a fortnight. The least disturbance brings him madly at the intruder.

The alligator lies in close proximity to the place she has deposited her eggs. The incubating fowl shifts the position of her eggs in the nest. Moisture is borne on the feathers to furnish the necessary dampness. The cuckoo[3] carries her eggs in her bill and places them in nests that otherwise are not available for the process of ovipositing. It may also be possible that she selects those nests whose environments are in harmony with the color of the egg.

The wagtail[4] has been known to remove its eggs to a different position when disturbed. Brehm asserts that an American nightjar, when disturbed, transported her eggs one after another to a more secure place.

What shall we call this interest in the egg? Is it love? If it is not it is the basis for it. Whether we call it love or not, it represents an industry that is so vital among intermediate forms of life, that they will often sacrifice their own life in defence of their treasure.

Evolution of the Nest. Nest-building represents an adjustment of life to environment for the better care and protection of progeny, and oftentimes the nest offers a means of protection for the parent. It represents also an extrasomatic state where-

[1] Ann. Nat. Hist., XVII, p. 463.
[2] Die Thierischen Gesellschaften, p. 393.
[3] Poulton: The Colors of Animals, p. 66.
[4] Nicols: Zoölogical Notes, p. 217.

by external substances are utilized as a protection for the period of infancy. The first approach to it is perhaps found in the burrowing instincts of certain marine forms, and, like some of the other anomalies of this lower fauna, the burrow is constructed for the concealment of the mature individual. Some of the marine annelids burrow for protection. The common earth-worm finds its home in a burrow. Among the mollusks,[1] the marine snail (Helix saxicava) bores into the rocks for places of safety, using, it is thought, its gastric juice to dissolve the particles of stone. Other mollusks, as the Pholas, Saxicava, Razor Shell, etc., have similar habits. Many of the crustaceans have peculiar instincts for concealing themselves in different ways, as though realizing their helpless condition. The land crabs are notable for their burrowing habits to secure places of safety.

Burrows for homes. Burrows in wood and in the earth, by land animals, are more properly retreats in the sense of houses. They represent places of safety for the adult, and are fitted out with nests for the young. Perhaps one of the extreme necessities for the burrow, in the case of many animals, is to afford a safe place during the hibernating period. A few of the reptiles and the tortoises burrow for this purpose.

The ants and the termites, in comparison to their size, are the most extensive burrowers. According to McCook[2] the first act of the fertilized queen is to go apart and found a new formicary. In doing this she does not cease her work until she has excavated a gallery from two to six inches in depth. Then comes the duty of rearing and providing for the first brood of workers, and it is probable that her share of the work of gathering food and excavating does not cease until the family is well increased in numbers. The excavation is soon enlarged into a net-work of winding tunnels. Forel[3] and Espinas,[4] and others in their studies of ants have noted that the great number of tunnels and that the irregularity of the entire structure is due to the perfect freedom of each ant to work out its own plan. Only after a second ant has caught the plan of the first, does it assist, and others join in the work. The persistent patient worker may succeed, after many fights for supremacy, in winning others to its plan and lend shape to a part of the work. Each one starting independently—often destroying what others have done—is the key to their labyrinthian home.

---

[1] Wood: Homes Without Hands, pp. 114-128.
[2] Agricultural Ants of Texas, p. 99.
[3] The Social Life of Ants, Int. Monthly, May, 1902.
[4] Die Thierischen Gesellschaften, p. 371.

Moggridge[1] placed some Barbara ants in a glass jar in the evening, the next morning there were ten openings in the soil. He says, "It seems to me that the ants displayed extraordinary intelligence in having thus at a moment's notice devised a plan by which the superabundant number of workers could be employed at one time without coming in one another's way. These numerous and funnel-shaped entrances admitted of the simultaneous descent and ascent of large numbers of ants and the work progressed with proportionate rapidity. After a few days only three entrances and eventually only one remained open." In their work imitation is manifest and it is thought that they are able to profit by experience to a certain extent. They are able to adapt themselves to new circumstances and the ability to choose seems to be manifested at times. The larvæ are cared for by the young ants, and their social nature no doubt to a great extent depends on the care and treatment during this period of helplessness.

Closely related to the ants in habits, and scarcely less remarkable for their wonderful burrows, are the termites. These live in societies similar to the ants and like some of them are divided into castes or classes. The two principal classes are the workers and soldiers. Grassi[2] thinks that the workers are individuals whose development is arrested. They resemble the young, their sexual organs remain undeveloped, and other organs, as the eye, are only partly developed. While there may be two classes, workers and soldiers, they are not differentiated so much in their instincts although there are modifications of structure. Food, or the mode of feeding, he thinks is what distinguishes the anatomical structure of the winged forms, soldiers and workers.

Among the mammals the mole is an extensive burrower. At some central point, leading to this by several underground paths, it constructs its nest. The hamster has a special apartment set off for the storing of grains for food. Most deep burrows have two or more entrances. These are valuable for ventilation and may be used for escape in case of danger. Among social animals, as the prairie-dog or Vizcacha, the individual burrows form a small village, and to a certain extent, regularity is observed in constructing them. For most mammals, the burrow in the tree, the retreat in the crevice of the rock, the lair under the shelter of the cliff, etc.; wherever the fixed abode may be; these places are fitted out with a soft lining of some kind for the comfort of the resident, and usually in addition soft nest material is provided when the young are brought forth.

---

[1] Harvesting Ants and Trap-Door Spiders, p. 44.
[2] Cambridge Nat. Hist., Vol. VII, p. 376.

Among insects the trap-door spider finds a similar retreat. The young animal or insect that finds its home in such surrounding seems instinctively to take up its work to construct such an abode.

Ingersoll[1] speaks of a young badger reared in confinement when allowed freedom would burrow for hours. The gnawing of rodents is familiar. Moggridge[2] mentions the burrowing habits of the young trap-door spider, and says: "That so young and weak a creature should be able to excavate a tube in the earth many times its own length and knows how to make a perfect miniature of the nest of the parents, seems to be a fact which has scarcely a parallel in nature."

Burrows Especially for the Young. The burrowing habits of insects and animals have led to special adaptations of jaws, beaks and claws. The mandibles of some of the beetles, the teeth of the rodents, the strong front legs and claws of the mole or badger, all indicate special adaptations that have developed along lines of vantage.

After the quiescent stage of summer the female Scarabaeus beetle[3] enlarges its burrow and collects a food-mass to the extent of a moderate sized apple in preparation for its young. The material is so arranged that the egg may be deposited on the softest and most edible part of the food. As a further precaution, for the first meal, a small mass of more nutritious and partly digested food is placed near where the egg is to be laid. After ovipositing the burrow is sealed up.

The mother lives to rear a second generation during the summer. Some of the solitary wasps, on the contrary, construct well provisioned burrows for the young they do not live to see. These have been delightfully described by Peckham.[4] The Urinaria is one of the interesting of the nesting wasps. After the female has dug a little burrow about an inch in depth she enlarges a little chamber. When it has been provisioned and the egg deposited it is closed with two or more pellets of dirt, and as a means of concealment more dirt is kicked over it.

The Ammophilia is said even to use a stone to pound down the dirt in her burrow. Most of the solitary wasps place the egg on some particular spot of the larder; the Sphex placing it on the ventral side of the captured cricket. According to Peckham[5] the adherence to a general style of nests is dependent on instinct, but individual difference and experience leads them to depart more or less from the type.

---

[1] Wild Neighbors, p. 144.
[2] Harvesting Ants and Trap-door Spiders, p. 126.
[3] Sharp: Camb. Nat. Hist., Vol. VI, p. 197.
[4] Solitary wasps.
[5] *Ibid.*, p. 233.

Some of the birds, although perhaps less adapted to constructing underground habitations, find burrows suitable for their nests. The Kingfisher[1] is a common example. At the end of a short tunnel in the river bank it enlarges a chamber, and on the fish bones scattered therein for a nest, brings up its young. The sand martin[2] is a small bird constructing a similar burrow. Along the high sand banks, bordering the smaller streams, these small burrows may be numerous. They are worked in by the bird, using her beak, for a distance of about two and a half feet. In this sheltered retreat the nest is built and the young are brought up in safety, the position chosen is often difficult to approach.

One or two instances may be noted of burrowers in wood. Many insects, especially in their larval state find their protection here. The carpenter bee[3] (Xylocopa) hollows out galleries in worm eaten wood, and constructs a series of cells in the tunnel. The cells are stored with food for the larva, and sealed. When they reach a certain degree of maturity they pass out of the burrows in succession, by boring through the partition separating the cells.

No small number of birds construct tunnels in wood for their nests. When the female Toucan has begun to incubate she is fastened up by the male. A hole large enough for feeding is left and here she remains, fed by the male bird, until the young are almost mature. Such care on the part of the parents is believed to have arisen from the pilfering habits of monkeys and serpents. As a general rule the burrow is a safe retreat, and marks a very great advance in protecting the offspring.

Nests constructed of plastic materials. In attempting to classify the constructive activities of animals no sharp and fast lines can be observed. The moulding of the nest from some pliable material represents an advance in the line of invention. The placing of things together for a definite end is one step, but when a definite arrangement and shape is to be accomplished with these materials the advance is still greater. Whether the female carries a psychic model as a part of her dowry, whether it is the result of experience, or whether it is merely a reflex are questions that have been debated in this connection. Bethe[4] thinks it can all be explained on the ground of reflex action. Darwin[5] observed that the construction of cells by bees seemed to be "a sort of balance struck between many bees all instinctively standing at the same distance

[1] Wood: Homes Without Hands, p. 79.
[2] *Ibid.*, p. 75.
[3] Figuier: The Insect World, p. 367.
[4] Pflüger's Archives, Vol. LXX, pp. 100, *seq.*
[5] Origin of Species, p. 225.

from each other, all trying to sweep equal spheres." Maeterlinck[1] in his charming description of the bee says: "Their common sense has never been known to fail them; they have never, at a loss of definite decision, erected at haphazard structures of a wild heterogeneous nature. Though you place the swarm in a sphere, a cube or a pyramid, in an oval or polygonal basket, you will find on visiting the bees a few days later, that if this strange assembly of little independent intellects has accepted the new abode, they will at once, and unhesitatingly and unanimously have known how to select the most favorable, often humanely speaking the only possible spot in this absurd habitation."

One of the Myriopods[2] (Julus terrestris) when about to lay her eggs constructs a nest out of a mortar that she mixes. After burrowing down a short distance in the earth, she begins to form small pellets by moistening the bits of earth with the fluid from her salivary glands. "She works up these bits of earth with her jaws and front legs." When they are of convenient size and shape she places them together. The completed nest is shaped like a hollow sphere, the inside being smooth while the outside is rough. The nest is about the size of a small nut. She lays from 60 to 100 eggs through the opening left at the top and then she seals the little chamber with moistened earth and leaves them to their fate.

The Pelopæus, one of the solitary wasps, moulds the soft earth into a series of cells with her mandibles. In these she stores up spiders as food for her larvæ.

It was thought by Faber that the stored up prey had been paralyzed by a sting in some particular ganglion, but Peckham noticed that about as many of them were dead as alive. Many instances might be cited, especially among solitary wasps, of insects, moulding as it were, these cradles for the young. The honey bee moulds its cells of wax secreted in special glands, and the common wasp (Vespa) manufactures a kind of *papier-maché* by mixing the fibers of partly decayed wood with a salivary secretion. According to Hudson[3] the Ovenbird of South America constructs a dome shaped nest. In the autumn, when the ground is moist, the bird is busily engaged gathering bits of mortar; these are cemented together, often with hairs, and when the nest is completed it is a foot or more in diameter. A partition is placed in it back of which is a softly lined nest. In general, moulding is one of the skillful arts of animal life, and since it represents a labor for the offspring it reflects another line of adaptation. The adaptation

[1] The Life of the Bee, p. 141.
[2] Sinclair: Camb. Nat. Hist., Vol. V, p. 38.
[3] Naturalist of La Plata, p. 243.

is the building of something to encase the helpless young during the period of weakness.

Nests constructed of loose material. The simplest forms of this kind of labor may be observed among the amphibia. The female alligator [1] piles up some sticks and leaves near the bank of the stream. When the eggs have been deposited in this heap she lies in watch near by. The eggs are covered slightly but are incubated by the sun's rays. One class of birds, the Megapodia have a similar habit. The brush turkey [2] of Australia, for example, by tracing a circle of considerable radius, collects together a large heap of materials. In the work of building the male takes the initiative; when the eggs are laid he regulates the temperature of the fermenting mass by uncovering them during the day, to secure the heat of the sun's rays, and at night, again, scratches some material over them. When the young emerge they are able to care for themselves.

Excepting the four genera, comprising the megapodia, birds exert more or less care of incubating and feeding the young. In fact the uniformity is greater, in this respect, than in any of the other classes of vertebrates. Some classification is usually made in studies of their nesting habits. The division selected by Sutherland [3] will serve for this treatment. He divides them into three groups: first those of a low degree of intelligence, comprising the Ratitæ or running birds; a medium grade consisting of the lower half of the Carinatæ or Keel-breasted birds; and a third grade of superior intelligence consisting of the upper half of the Carinatæ, including the Passerines, birds of prey, etc.

Among those of the first class the ostrich,[4] for example, merely digs a hole in the sand where the eggs are deposited. A large part of the duty of incubation falls to the lot of the male bird, and in most cases he looks after the care of the young. The rhea and cassowary have similar habits. The second class includes birds like the barnyard fowl, pheasant, quail; marine birds as the petrel, gannet, penguin, etc., and other birds exercising little care in nesting as the pigeon, snipe, woodcock, etc. These comprise a great number of the avifauna and represent an advance in the structure of the nest, using sticks and grasses or perhaps some mud for building, and lining it with some soft material and often with feathers.

---

[1] Clark: Habits and Embryology of the Amer. Alligator; Jour. of Morph., Vol. V, p. 187.

[2] Nicols: Zoölogical Notes, p. 288.

[3] Sutherland: Origin and Growth of the Moral Instinct, Vol. I, p. 58.

[4] Nicols: Zoölogical Notes, p. 348.

The third grade represents the highest class of bird life. Among these the male and female, usually, both take part in building the nest, and the male takes his share of incubating, and of feeding the young. In this group are found such birds as the orioles with their intricately woven nest, swinging from the end of some branch. The humming birds delicately conceal theirs on the side of some limb; the parrots may accept some burrow in a tree; the birds of prey build massive nests, usually in the tallest trees, or on some elevated inaccessible place; the sparrows and thrushes conceal theirs in the grasses or among the bushes.

In regard to the habits of concealment, Oswald[1] says: "Animals in a state of nature are endowed with certain protective instincts to a degree which might often tempt us to believe the existence of a sixth sense. The nest of a green-finch on a willow, or chestnut tree defies detection, unless you should happen to espy the bird in the act of feeding her young." The tanager never takes a bee-line to the nest, quails, plovers and others feign lameness to deceive the intruder.

Burroughs[2] observes that nearly all the song birds build low; "their cradle is not upon the tree-top." A line five feet from the ground would run above more than half of all birds' nests and one ten feet would include three-fourths of them. The third class, of the division, represents the beautiful architecture of bird life. Many of the song birds, and especially those that care most for their young, show their high degree of intelligence in the preparation they make for the stage of weakness and immaturity. As in mammalian life the period of helplessness varies widely among birds. This highest class, as if realizing this period, build stronger nests and usually have a special lining in them.

Birds' nests in general. Wallace[3] was of the opinion that the young bird learned by observation and experience how to construct the nest. It has also been suggested[4] that probably an old bird mates with a young one, and thus they carry on the nest characteristic of the species. Dixon[5] noticed that some young chaffinches taken from England to New Zealand were at a loss how to build the traditional nest, and finally constructed nests similar to those of the hang-nests of that

[1] Zoölogical Sketches, pp. 97-100.
[2] Birds and Bees, p. 28.
[3] Natural Selection, p. 107.
[4] *Ibid.*, p. 108.
[5] Nature, Vol. XXXI, p. 533. (Dixon has recently written a book setting forth all the evidence he can collect to prove that the young bird builds by observing others of his species.)

country. While no definite experimental work on this point has come under the observation of the writer; and a discussion of the question could not find place here; yet the evidence seems to be that the process has an intelligent basis to such an extent that it could hardly be classed as a reflex act.

As the environment changes with the progress of civilization, if it is not destructive of food, bird life is responsive. The nest is woven with new materials, Burroughs[1] speaks of the change in the habits of the chimney swallow. The chimney is now preferred for nesting to the hollow tree.

Audubon records that the gulls along the St. Lawrence,—within the memory of the settlers there at that time—became arboreal when their eggs were being destroyed by the fishermen.

The tooth-billed pigeons[2] of Samoa became arboreal when their species was imperiled by the introduction of domestic animals. These changes in the habits of bird life denote an intelligence that responds readily and adapts itself to changes in the environment. The voluntary adaptations of bird life present themselves to our notice far more frequently than those of insects or mammals. The settling and cultivation of thickly populated areas has presented a new field almost entirely for bird life, but where they find protecting influences and food they continue to rear their brood as faithfully and as contentedly beside the great factory as in the remote forest.

Incubation. Incubation, in its more perfect forms as found among birds, has grown up with the evolution of new types of life, and probably as a result of the protection of the eggs and a disposition to remain with them.

Among some of the limbless amphibia[3] (Ichthyophis glutinosa) of tropical countries a simple process of incubation is found. The female digs a shallow nest near a stream of running water. When the eggs, about two dozen, are deposited the female coils around the entangled bunch to protect them. Among the reptiles[4] several species of the python have been observed to coil around their eggs, and some other species have a similar habit. Birds present the most perfect adaptation for this process. The nest is constructed to fit the body; and while feathers serve more than one purpose for the bird, they seem to be specially suited for incubation. The skin is thin and the temperature of the body is probably the highest of animal life. Nicols[5] observes that it is a regular hot-house

[1] Birds and Poets, p. 91.
[2] Sharp: Wonders of the Bird World, p. 49.
[3] Gadow: Camb. Nat. Hist., Vol. VII, p. 91.
[4] Origin and Growth of the Moral Instinct., Vol. I, p. 53.
[5] Zoölogical Notes, p. 51.

process—a forcing to rapid development. The temperature has been noted to rise at this period. Espinas [1] notes that during the period of egg-laying the bird is in a general feverish condition. The seat of this being the "*brüt-plexus.*" He further suggests that the incubating period is one of rest that follows this stage of excitement. The temperature of the python [2] has been noted to rise several degrees during incubation. Whitman [3] recognizes three philetic elements, which he thinks are rooted far back in preavian forms, in the incubating instinct. The first is the disposition to remain with or over the eggs, as is the case with certain mollusks and worms; second the disposition to protect them from enemies, as with the stickleback; third a periodicity that coincides with the recuperative stage.

The perfection to which it is developed in bird life is no doubt a concentration along more than one channel of development. A noteworthy fact is the part the male takes in incubation. This interest on the side of the male begins among the fishes. Among the highly specialized forms of birds the male takes his share of the work of incubation. The ostrich in this respect may be considered as highly specialized. Incubation as a process of external development represents the growth of interest and care for the welfare of the ova, and the induction of the male to a part of the work represents the tendency of this interest to become more and more intensive and extensive.

Special adaptations of the organism. When the ova is extruded, one of the simplest of useful developments is exhibited by glands, the viscid secretion of which moors the ova and keeps them in place. Some moths cover the eggs with fur from their own body, "which,[4] in the case of certain of the Eggers (Lasis campidæ), seems to have a special supply for the purpose."

The Janthina,[5] a reptile, swims to the surface of the water, and by a peculiar bending of its body enfolds air bubbles, these are held together by a secreted slime forming a raft, to these the eggs are fastened and held suspended in the water.

The spider has all the material for constructing the delicate cradle for its eggs, and plenty left to spread a large net for capturing food.

Emerton [6] describes the formation of the egg cocoon. The female (Drassus) spins a little web across her nest, and drops

[1] Die Thierischen Gesellschaften.
[2] Sutherland: *op. cit.*, p. 51.
[3] Biological Lectures, 1898, p. 324.
[4] Sharp: Camb. Nat. Hist., Vol. VI, p. 322.
[5] Schneider: Die Thierische Wille, p. 174.
[6] The Structure and Habits of Spiders, p. 99.

the eggs on it. These are mixed with a liquid and "are discharged in one or two drops of jelly." After the eggs are laid the spider covers them with silk, drawing the threads over them from one side to the other, and fastening them to the edges of the web below. When the covering is complete she bites off the thread, that holds the cocoon to the nest and finishes off the edges with her jaws." Romanes[1] has offered an explanation as to the origin of the web-building structure, and thinks it has been carried over, or at least is a concomitant of certain larval forms. That its first use was that of locomotion or cocoon spinning as it is used by some caterpillars for descending from heights and others for spinning the cocoon. He says: "It is easy to see how if there were any original tendency to secrete a viscid substance—this might be utilized in descending from low elevations (as certain kinds of slugs use their viscid slime as threads to let themselves from low branches); and so we can understand how natural selection might thus have the material supplied" to develop even spinnerets.

Other instances might be given of secretions, of a physiological basis, arising as the period of procreation approaches; as that of the "supra-salivation" of certain swifts (forming edible birds' nests) and that of the male stickleback. The latter[2] according to Möbius weaves together his nest with special catabolic elements, in the form of mucous arising from the pressure of the enlarged testes on the kidneys, at the period of sex excitement. The viscid secretion with which the paradise fish of India glues together the air bubbles for a nest may have a similar basis.

If the ova, instead of being extruded when it is ripe, hatches within the ovaduct of the parent the chances of destruction, compared with any external position it may have, is lessened. How such a process could have arisen might be explained from the habits of certain oviparous reptiles. A constrictor[3] kept in confinement gave birth to a family of living young. The explanation being that the eggs were retained, one by one, near the cloacol aperture until the young emerged. The retention was perhaps induced by finding no suitable place to deposit them. This represents the first stages of one of the great economic processes of nature. Its maximum perfection is found in the complex intra-uterine development of the human race. The ovaduct as a depository for unripe ova is common among some fishes (180 species according to Suther-

[1] Animal Intelligence, p. 208.
[2] Geddes and Thomson: The Evolution of Sex, p. 251.
[3] Nicols: Zoölogical Notes, p. 27.

land);[1] and to a lesser extent among the amphibia as a whole, while about one-half of the reptiles are viviparous.

The marsupial represents an imperfect stage, yet a great advance. The young are brought forth at the completion of their ovarian development and placed by the mother in an external pouch. The lacteal food is forced into their mouths by special muscles surrounding the mammæ. The soft fur-lined pouch affords a portable nest for the young. Among the mammals above the marsupials the ova is supplied with little food and upon hatching a union is established between the parent and offspring by means of the fœtal membranes of the latter. Through the various modifications of these membranes nourishment is drawn from the parent until the expulsion of the young. Hertwig[2] thinks that the mammalia "have descended from animals which possessed large eggs with abundant yolk, which were oviparous," and in which consequently the embryonic membrane were developed in the same way as in the eggs of reptiles and birds. Mammals higher than the marsupials are generally divided into two classes as regards the intra-uterine development. This is based on the degree of complexity with which the embryo is united to the walls of the uterus. The lower class of mammalia, the non-deciduate placentalia, according to Landois and Sterling,[3] possess only chorionic villi supplied by the umbilical vessels, which project into the depressions of the uterine mucous membrane, and from which they are pulled out at birth" (*e. g.*, pachydermata, cetacea, solidungula, camelidæ). In the ruminants the villi are arranged in groups which grow into the uterine mucous membrane. Among the deciduata the union between the chorionic villi and the uterine mucous membrane is so firm that the uterine part of the placenta is separated with the fœtus at birth.

This mode of development leading to the formation of the womb represents a constructive process on the part of the female for the young, but destructive in its general effects on the parent. The sacrifice of her body for the food and shelter of the young. Among some insects the sacrifice is even greater if less perfect in its general completeness. The female scale insect extrudes her eggs and the dried shell of her body forms the covering and protection for them. The cochineal insect becoming full of eggs dies, and thus protects her offspring, encased within her body. So important is species and so great is the struggle for survival that every superfluous element is sacrificed, and only the highest possible economy fulfills the

[1] Origin and Growth of the Moral Instinct, Vol. I, p. 36.
[2] Embryology, p. 222.
[3] Text-Book of Human Physiology, p. 876.

requirements of nature. Such an advance is that along the line of viviparous development. With the life of the female goes food and shelter for the young, and among the highest mammals and man an intelligent care whose influence in moulding the nature of the young according to that of the species makes up one of the great forces of life.

The house as a dwelling. It is thought[1] not improbable that the first steps in architecture were shelters or shed-like constructions for the protection of the sacred fire. That public, and private, sacred and profane architecture, have alike sprung from these rude beginnings, which only after a time men dared to inhabit. This theory of the beginning of any kind of artificial shelters antedates the testimony of the remains of the primitive cave-dweller. The troglodyte was content with the cave, or, later scooped out the soft stone along the banks of the Marne Valley to resemble caves. Some[2] think the Eskimo huts to be the representatives of these old cave-huts. The Adaman[3] Islander may still be seen to scoop out his bed in the sand under cliffs. Houssay[4] arranges the dwellings of animals in three sets; (a) those which are hollowed out in the earth or in wood; (b) those which are constructed of light materials often woven together; and (c) those which are built of clay or similar material. We may compare these to the caves, wigwams, and buildings in which men find their homes.

The second class are the homes of the nomadic tribes. The tent or wigwam is a temporary house, and is taken along from one place to another when in search of food. This arrangement is especially characteristic of most Indian tribes. Some tribes, not included in this classification, as the Bushmen,[5] live in crevices among rocks, and in South America[6] the naked Puris make shelters or sloping screens of large palm leaves. The Botocudos stick the large palm leaves in the ground and draw the tops together. Australians set up a line of leaf boughs to break the wind for the night.

Such habitations approximate that of the higher apes. The Orang prepares himself a sort of nest; "little[7] boughs and leaves are drawn together round the selected spot and bent crosswise over one another, while to make the bed soft, great leaves of ferns, of orchids, etc., are laid over them. 'The rude hut' says Sir James Brooke, 'which they are stated to build

---

[1] Reclus. Enc. Brit. Fire, p. 230.
[2] Starr: Some First Steps in Human Progress, p. 150.
[3] Tyler: Anthropology, p. 229.
[4] Thomson: The Study of Animal Life, p. 121.
[5] *Ibid.*, p. 151.
[6] Tyler: Anthropology, p. 231.
[7] Huxley: Man's Place in Nature: Essays, p. 47.

in the trees, would be more properly called a seat or nest, for it has no roof or cover of any sort. The facility with which they form this nest is curious, and I had an opportunity of seeing a wounded female weave the branches together and seat herself within a minute.' ''

Haberlandt[1] thinks that primitive man prepared this shelter principally for the purposes of sleep. Civilized man has controlled this according to his work, but for the savage the need of sleep was great.

The nature and the structure of the dwelling is dependent on the environment, and is generally suggested by it. The pile-dwellings which were prevalent at times in different parts of Europe were in fact rude castles for defence.

Mason[2] has recognized eighteen sections of America that are so distinguished as to give rise to as many kinds of habitations. The arctic area has given rise to underground igloos of earth on timbers or whalebone, snow huts and summer tents; Athapascan region to conical bark lodges; the Algonquin region to conical and cylindrical lodges of skin or bark; the Southern United States to huts of cane; plains of the West to skin lodges in circles; the North Pacific to communal barracks; Vancouver Island to communal houses; Interior Basin to shelters; California and Oregon to insignificant shelters; Pueblo region to differently constructed pueblos; Middle America to thatched and daubed huts and cut stone buildings; Littoral and Insular Americas to thatched huts; Cordilleras of South America to fortified villages and thatched huts; Andean Atlantic slope to thatched wooden houses; Eastern Brazil to immense huts and shelters; Central South America to open shelters, palm huts and roofs; Argentine and Patagonia to skin tolderias or awnings; Fuegians to miserable huts of watling covered with grass.

Among the cliff-dwellers the desire for defense was the chief motive of the dwelling. It is thought[3] that the structure of these habitations bear within themselves the record of a change from the nomadic to the sedentary condition of living and that their terraced structures was suggested by the shape of the cliff.

The Beehive houses, according to Lubbock,[4] date from the stone age. Among the negroes of Africa they are so much used that they are recognized as characteristic of that country and people. They are found in other warm countries, as among

[1] Ethnology, p. 27.
[2] Smith Report, 1895; Influence of Environment on Human Industries, pp. 656-661.
[3] Peet: Amer. Antiqua., Vol. XXI, p. 318.
[4] Pre-Historic Times, p. 57.

the Indians of California and the natives of the Philippines. The structure of the African huts is varied. They may be of straw, sticks, leaves, matting, says Starr,[1] "of one room or of many, large or small; crude or wonderfully artistic and carefully made. They may be permanent constructions to be occupied for years or temporary shelters for a single night; they may consist of frame work made of light poles over which are thrown mats or sheets of various materials and which after using can be taken apart, packed away and transported."

The work of constructing the shelter has generally fallen to the lot of the woman. Among the Indians the wigwam was made and put up by the women.

The women[2] of the Adaman Islands erect the shelter. The Malayan and Polynesian houses are built by the joint work of both sexes. The same is true for some of the negroes, the men doing the heavy work. The Eskimo snow hut is built by the men. Among the Zuni[3] Indians the women regard any repairs as their part of the labor. When the house is to be erected the men lay the stone foundation and set in place the logs for the support of the roof, and do most of the heavy work, the women do the plastering.

The general idea, most common among savage races in regard to the division of labor, is that the function of the husband is that of a food-getter, and it is his duty to protect the family. That of the wife is to produce offspring. In the growth of the home woman has been instrumental in its enlargement, a true evolution from within outward. Mason[4] observes that we are indebted to her for the oven, the chimney, and the chimney corner, the kitchen, the dining-room, the family room and the separate bed-chamber. This growth, as completed, approximates the house of civilized races.

The development of architecture has kept pace with the progress of industry in general. As man gradually emancipated himself from the struggle for mere subsistence, changed his nomadic life to the sedentary, leisure and freedom were found for the erection of better dwellings.

But far back beyond the first dwelling, when the mother erected the first shelter for her babe, began the development of sentiment, the widening out of this first narrow stream found expression even in the shelter for the young. The love for the child became wide and strong enough to include everything that was for the child's welfare.

The crude shelter came to have an element of beauty even in

---

[1] Some First Steps in Human Progress, p, 151.
[2] Mason: Woman's Share in Primitive Culture, p. 152.
[3] Peet: American Antiquarian, Vol. XXI, p. 38.
[4] Woman's Share in Primitive Culture, p. 235.

its structure and house building passed over into architecture, a history of which marks the growth of love and is a record of man's appreciation of the beautiful.

The relative importance attached to the house depends to a great extent on the climate, like the use of clothing, when absolute necessity is the test, inventive genius is equal to the emergency. The house of civilized man is characterized by symmetry of parts, and is generally considered a reflection of the state of culture of the people. Expression in architecture has found its widest vent on the side of religious emotion, and the house of worship—the abode of the gods,—has called forth the greatest effort to beautify and enlarge the religious ideas of man.

Comfort of Young. Among animals, besides the carefully prepared nest, no further provision is made for the comfort of the young. If the mother of the young ape [1] dies the offspring is adopted by some other member of the group. They are also said to express very great solicitude for their young as they carry them about with them. The fowl broods over her young and warms them from the heat of her own body. Many of the higher animals will remove their offspring on the approach of danger, and may conceal them in some place of safety. With man, a part of the labor is to prepare for the comfort of the offspring, and this is kept up until the period of helplessness is passed. One of the first provisions of comfort is that of clothing. Tyler [2] says that among the rudest tribes, even in hot districts, something is generally worn either from ideas of decency or for ornament. In such countries its use is so closely connected with that of ornament that it is thought to have arisen from some manner of decorating the body. In colder countries it becomes a necessity, and especially for the babe. A provision more general, and associated with that of dress, is that of the cradle. It is the separate bed set apart for the babe.

Ploss [3] says that in general it is an apparatus for protection and concealment.

Mason [4] sums up the uses of the cradle among the American aborigines as follows: "(1) It is a mere nest for the helpless infant.

"(2) It is a bed so constructed and manipulated as to enable the child to sleep either in a vertical or a horizontal position.

"(3) It is a vehicle in which the child is to be transported,

[1] Brehm: Mammals, p. 6.
[2] Anthropology, p. 236.
[3] Das Kleine Kind, p. 67.
[4] Smithsonian Report, 1887; Cradles of the Amer. Aborig., pp. 161-212.

chiefly on the mother's back by means of a strap over the forehead, but frequently dangling like a bundle at the saddle bow. This function of course always modifies the structure of the cradle, and indeed may have determined its very existence among nomadic tribes.

"(4) It is indeed a cradle to be hung upon the limbs to rock, answering literally to the nursery rhyme:

> Rock-a-bye baby upon the tree top,
> When the wind blows the cradle will rock,
> When the bough bends the cradle will fall
> Down will come baby, and cradle, and all.

"(5) It is also a playhouse and baby jumper. On many, nearly all, specimens may be seen dangling objects to evoke the senses, foot rests by means of which the little one may exercise its legs, besides other conveniences anticipatory of the child's needs.

"(6) The last set of functions to which the frame is devoted are those relating to what we may call the graduation of infancy, when the papoose crawls out of its chrysalis little by little, and then abandons it altogether. The child is next seen standing partly on the mother's cincture and partly hanging to her neck or resting like a pig in a poke within the folds of her blanket."

What was the primitive form of the cradle?

Ploss[1] thinks that there are two different varieties that may be pointed out as original types. One is the round basket, perhaps of wicker, and the other is the hammock cradle. Many people possess only the first form others the second while some have both. The nomadic tribes—given over to the hunt or chase—or tending flocks, have only sacks or pockets, as the Hottentots, for example. The Brazilian[2] Indians place the new-born child in a bed of cotton material, or a hanging cradle, and it is hung up in the open air. The Dyaks[3] of Borneo hang the child up in a mat. The hanging[4] mat is used among the Russian peasants, in Trans-Caucasia, Asia Minor, to Persia. Among the Persians there is, sometimes, two posts set up for the reception of the swinging cradle. Some other people that use the hanging cradle are some of the North American Indian tribes; some tribes of Africa; Armenians, and some Slavic peoples.

The varieties of cradle in use among the Indian tribes are widely diverse. The cradle board or frame beautifully illus-

---

[1] Das Kleine Kind, p. 72.
[2] *Ibid.*, p. 73.
[3] *Ibid.*, p. 74.
[4] *Ibid.*, p. 76.

trates Bastian's study of "great areas" says Mason,[1] in that it is the child of geography and of meteorology, "In the frozen North the Eskimo mother carries her infant in the hood of her parke whenever it is necessary to take it abroad. If she used a board or frame the child would perish with the cold." Then we have the southern limit for the frame as northern Mexico. The Eskimo has an enlarged hood for the child. The birch bark cradle is found among some Alaskan and Cape Breton tribes, "the[2] trowel-shaped cradle of the Oregon coast; the wicker cradle of the Hupas; the Klamth cradle of wicker and rushes; the Pomo cradle of willow rods and wicker work, with rounded portion for the child to sit in; the Mohave cradle, with ladder frame, having a bed of shredded bark for the child to lie upon; the Yaqui cradle of canes, with soft bosses for pillows; the Nez Percé cradle-board with buckskin sides, and the Sahaptian, Ute, and Kootenay cradles which resemble it; the Moki cradle-frame of coarse wicker with an awning of dressed buckskin; the rude Comanche cradle made of a single stiff piece of black-bear skin; the Blackfoot cradle of lattice-work and leather; the shoe-shaped Sioux cradle, richly adorned with colored bead-work; the Iroquois cradle (now somewhat modernized), with 'the back carved in flowers and birds and painted blue, red, green and yellow.'" The cradles of the North American Indians are thus somewhat summed up by Dr. Chamberlain. The significant feature of the cradle, especially among peoples above the nomadic state, is its adaptation for a swinging or rocking motion. The sensation of motion has a soothing effect on the tender skin of the babe, and the motion of the cradle tends to shift the pressure to different parts of the body and thus lessen the feeling of pressure. The "sensation of motion is a pleasure-giving sensation" says Kline,[3] "that has not been sufficiently analyzed." However it may point to lower levels of life, and be the expression of the long ages of struggle for existence, especially where life depended on swiftness, alertness and activity.

More recent people have connected with the cradle some curious superstitions. In Holland,[4] rocking an empty cradle is thought to be injurious to the infant and a prognostic of its death. In Sweden, it is thought to make the child noisy and given to crying if the empty cradle is rocked. In Durham and Yorkshire it is ominous of another claimant for that place.

The Sioux woman carries her empty cradle, or keeps it in

[1] Report, Nat'l Museum, 1887, p. 162.
[2] Chamberlain: The Child and Childhood in Folkthought, p. 123.
[3] Migratory Impulse, *Amer. Jour. Psy.*, Vol. X, p. 62.
[4] Henderson: Folk-Lore of the Northern Countries, p. 19.

sight with some image in it to keep green her memory for the lost child.

In Germany,[1] there are many places at which a golden cradle is supposed to be hidden in the earth. At Schildthurm, a silver cradle was placed in the church to which unfruitful women came and rocked with the hope that they might be blessed with children.

The use of fire in the home. No one thing has marked off the human home from that of the animal more than the use of fire. The earliest remains of their dwellings show traces of its use. The cave dwelling, the kitchen midden, and the lake-dwellings have traces of the charred remains of their early food-getting habits and preparation. In fact primitive man comes to us thus armed for the cold climate and thus prepared to face new dangers and enemies. It served him as one of his chief weapons to overcome the mammoth that dared attack him. When no weapon would pierce the tough skins of the dangerous beast then the fire brand was used to frighten it away. Few peoples do not know how to produce it and none of the races or tribes[2] are without its use.

The aptitude of primitive man to myth and tradition to weave into his life the things most closely associated with him has made it a god, and wrapped its history in the strangest myths. It becomes for the low savage, almost a vital principle and its virtue transforms it into something mysteriously pure. It is no doubt associated with the sun above and the volcanic action below. The Parsees[3] of India still holding on to the old Persian religion are worshippers of fire. In times past the Brahmans, Ghebers, Peruvians, Hindoos, and Romans, among many others, have either worshipped it or given it a place in their religion. Both in time and space the custom has been widespread,—finding place among the Chaldees, Hebrews, Greeks, Romans, Peruvians, and Mexicans, either in their religious or funeral customs.[4]

The Zend Avesta forbids putting anything unclean into the fire and no indecent act is to be committed before it.

In Albania[5] it is an unpardonable offence to spit in the fire.

Heraclitus in his attempt to find the abiding substance declared that the world was an "ever-living fire" and that fire was the essence of all things. There have been many strange myths as to its origin. The Australians[6] say that a selfish

---

[1] Ploss: Das Kleine Kind, p. 102.
[2] Tyler: Early Hist. of Mankind, p. 235.
[3] Deniker: The Races of Man, p. 219.
[4] Joly: Early History of Fire, Pop. Science Mon., Vol. IX, p. 17.
[5] Reclus. Enc. Brit., Fire, p. 230.
[6] Joly: *op. cit.*, p. 21.

little bandicoot owned the first firebrand, and that it was gotten from him only after a council of war had been held by the other animals. It was then handed over to man. The Peruvians[1] say that the sun,—the wife of the moon—fell down to the earth once, and was helped up again by an Indian, the second time it fell down it set the forest on fire.

The New Zealanders[2] trace the origin of fire through Mafinke,—an old blind woman who lives in the lower regions. It was only after she had been threatened with death would she share her treasure. Among these people "no fire is allowed to be kindled at night in the houses of the people all the year round. It is sacred to the god, and so after sundown they sit and chat in the dark." With the Kaffirs every religious ceremony must be performed in front of a fire. "In the Rig Veda[3] the crackling of the blazing twigs is regarded as the speech of the gods, just as it is to-day in Borneo." The Legend of Prometheus, according to Tyler,[4] has a close connection with the old Brahmin *pramantha; i. e.*, the spindle for making fire, and the symbols used for it are identical with those for reproduction.

The Roman temple Vesta[5] had no other goddess for worship except the vestal fire that was kept burning. If this by chance was extinguished all business ceased. The connection between heaven and earth had been broken.

Survivals of fire worship are to be found in the "new fire" ceremonials. Brinton[6] says "we have but to enter a church of the Roman communion on the morning of Holy Saturday to witness the impressive ceremonies with which the creation of the 'new fire' is to this day celebrated in our midst."

The instances given show the great rôle that fire worship has played among primitive peoples. When it was brought into the home it was like the advent of the gods, and the early primitive hearth was a place of worship. It was a living thing and no doubt the resemblance of the dying embers to the ebbing spark of life wrapped up its life more completely in that spirit world, which plays so great a part in savage welfare.

The hearth or family fireside is a tie that binds the members together. "All Greece confederated making Delphi its central hearth, and the islands congregated around Delos, whence the new fire was fetched every year."

The prytaneum was the common hearth for the city. On

[1] Tyler: Prim. Cult., p. 288.
[2] Tyler: Early Hist. of Mankind, p. 231.
[3] Brinton: Relig. of Prim. Peoples, p. 142.
[4] Anthropology, p. 396.
[5] Reclus. Enc. Brit., Vol. IX, p. 229.
[6] Religion of Prim. Peoples, p. 142.

this there burned a perpetual fire. It was sacred to Hestia, the personified goddess of the hearth.[1]

The family tie, linking one member to another, grows up around the fireside. It is the meeting place where tradition and custom are passed along from generation to generation. The savage here related his encounter with this animal and his narrow escape from that one; all their traits and peculiarities were given crude anthropomorphic significance. Old traditions of monsters; the story of the brave warrior, legends of animals, spirits, etc., were here related. In this way the fireside was the school.

So much of primitive, savage, and even civilized life is spent around the fireside, that some accumulated effect, if such can happen, has certainly grown up with its associations, and we prefer to be around the open fireside. Dr. Hall[2] collected data in regard to fear of fire, and in his article says, "Traces of the charms of these old associations are abundant in child-life as other returns show. Just to idly gaze at fire now starts dreamy reveries, veined through which are traces of very primeval yet earnest thinking. It stimulates memory and story. . . . The very play of form and color half hypnotizes and autonomizes the mind, and as we see solid matter volatilize to smoke there seems some mysterious power within and behind it all."

Food. The conformation of the digestive system and the dental arrangement in man indicate that at some period he was frugivorous. War and migration tended to widen his habitat, and from necessity he became omnivorous in his diet. With the advent of the use of fire in the preparation of food came a great advance. Tribes that cook food are more enterprising and energetic than eaters of raw meat.

Cooking lessens the amount of food required and is a saving of energy. It has further enlarged man's dietary to include foods either poisonous or unpalatable in their raw state.

Roasting or broiling is the one process that is most universal. The Adaman[3] Islanders keep the fire smouldering in hollow trees so that they only have to clear away the ashes to broil their fish or pigs. The Tasmanians[4] neither skinned nor disemboweled animals before cooking, but placed them whole on the fire. The ant hills were cleaned out by some of the African[5] tribes and a fire built within the pit, when this was removed the rhinoceros joints were roasted in the temporary oven. Slight variations among other tribes, as those of Madagas-

---

[1] Joly: Enc. Brit., Vol. IX, p. 230.
[2] Study of Fears, *Am. Journal of Psy.*, Vol. VIII, p. 181.
[3] Tyler: Early History of Mankind, p. 261.
[4] Mathew: Eaglehawk and Crow, p. 28.
[5] *Ibid.*

car, South Sea Islands and tribes of Polynesia, were to place hot stones on the food to be roasted.

The Chinese legend, as set forth by Charles Lamb, is that roasting of meat came about by the accidental burning of a building. In order to have roast pig it was necessary to burn down the building. The Assiniboin Indians practice stone boiling by digging a shallow pit and lining it with the hide of some animal which they have slain, as the buffalo. Water and the food to be boiled is placed in this and then heated stones are dropped in.

The different methods of cooking by different races show steps of advancement.

Starr[1] thinks the steps in the growth of cookery have been: first, "roasting or parching; then came baking; then broiling." Parching of grains is common among most peoples.

A few races yet in their degradation, and especially in times of severe need, will resort to the lowest forms of life for food.

The Australians[2] will make a meal on fish, bats, frogs, lizards, snakes, or worms.

The Malayan[3] tribes, the Bushmen, Pigmies of Africa, and the Fijians are degraded in their diet.

With domestication of animals comes an advance in the quality and permanence of the food supply. With agriculture the permanence of the habitation. The savage who depends on an irregular food supply can never comprehend regularity, and, says Buckles,[4] his irregularity "would prevent him from suspecting anything like method in the arrangement of nature, nor could his mind even conceive the existence of those general principles which govern the order of events."

Regularity in work has given rise to regularity in meal time. According to Pavy,[5] "Carnivorous animals apparently thrive best when fed at long intervals; herbivorous, when they are constantly eating; man being omnivorous, his food should be taken at intervals of much less duration than the carnivora."

One of the first advances in the evolution of the meal-time is found in the communal home.

There one meal is prepared each day for the household. Such was found among the Iroquois,[6] and the Spaniards found an elaborate dinner prepared each day in Montezuma's Castle.

---

[1] Some First Steps in Human Progress, p. 32.
[2] *Ibid*, p. 31.
[3] Hutchinson: Living Races.
[4] Influence of Food on Civ., N. A. Review, Vol. CXXXV, p. 548.
[5] A Treatise on Food and Dietetics, p. 510.
[6] Morgan: Houses and House Life of Amer. Aborigines, p. 101.

The change from the apparent freedom of the savage to that of the fixed rules and customs of society is somewhat difficult.

Morgan [1] mentions a Seneca chief, whose daughter had been educated in the usages of civilized life, who desired the usual food constantly prepared ready to offer any person who entered their house, "saying that he did not wish to see the custom of their forefathers laid aside," although they had adopted the regular meals of civilized society.

In the effort to get food, the water is looked upon as the place of least effort. The lake dwellers built their huts over the water, and could count on its supply for food. And for many tribes it is a natural reservoir. Morgan [2] thought that the principal reliance of the American aborigines was on fish. That "they were in reality from first to last, nations of fishermen, who eked out their scanty sustenance with game, natural fruits, and bread roots, and afterwards—a portion of them—with the products of a limited agriculture."

The Athapascans and Ojibways subsisted almost entirely on a fish diet while the Aztecs and Thascalans subsisted chiefly on vegetable food. The other tribes were intermediary in their diet between these extremes.

He further divided mankind into five [3] classes depending on their foods. The lowest class are those who have a natural subsistence of fruits and roots and are restricted to a more or less definite habitat. The second class are those subsisting on fish, the third class by means of cultivation have a farinaceous subsistence; the fourth class are those subsisting on meat and milk, and the fifth class are those having an unlimited subsistence through field agriculture.

These are in fact steps marking the subsistence of many of the existing peoples.

The influence of food on the individual in the different stages has been often noticed, and the best labor and results are gained by having the best and greatest variety of food. The dwarfed stature of the Bushmen, goes well with his degraded habits, and the food of the Eskimo leaves a smaller margin for growth after the heat for an arctic climate is set free.

Some foods have been esteemed especially virtuous. Honey has been regarded as having great virtue because of its near relationship to the nectar of the gods. Dr. Chamberlain [4] has collected some information in regard to the food of children and its relations to the gods.

Among the Friesians and Germanic tribes the child could

[1] *Op. cit.*, p. 46.
[2] Beach: Indian Miscellany, p. 164.
[3] Ancient Society, p. 19.
[4] The Child and Childhood in Folk-thought, pp. 145–151.

be exposed, or put to death, so long as it had not taken food, "but as soon as the infant had drunk milk and eaten honey he could not be put to death by his parents." In Iceland, in ancient times, "the food of the suckling was sweetened by honey."

Among the Germans, Greeks, Slays, Hindoos, etc., milk and honey have been esteemed the food of the gods. These were the first foods for the child and we have the first step in the external relationship of the child-life to the god-life beyond.

When fire came into the home as a living deity that watched over and assisted the family, its use to prepare food made it the chief center around which the family gathered, and around it they partook of their meals, after having first offered a sacrifice to it. "The hearth," says Keary,[1] "was to each member of the household as it were an *umbilicus orbis*, or navel of the earth." But this holds true no less to-day for all peoples and classes. The strongest and most fundamental desire is that for food, and all civilized races instinctively look to the fireside as a sort of birthplace of food. The change from the state of natural subsistence to that of cooked food has been attended with no disaster to the race while, on the other hand, it has been the greatest of economic achievements,—the *sine qua non* for present civilization.

Some animals, as the ant, a few birds, the squirrel, the bee, have the art of preserving foods for winter; some, as the bear, and woodchuck, live through the winter upon the fat stored up, but the great majority of animal life keep up the ceaseless struggle for subsistence. The cheek pouches of squirrels, monkeys, gophers, mice, etc., are excellent adaptations for carrying food. The social stomach of the ant, as Forel[2] calls it, is another adaptation for storing and preserving food. It is also a factor that contributes to perfect their life for societies. In cold countries, insect-eating animals pass a quiescent state during the winter corresponding to the winter sleep of the insect, or in warm countries a period of aestivation.

Wesley Mills[3] has made a study of hibernation among animals, and especially that of the American marmot. He divides the life of this animal into four periods; (1) "A period characterized by either drowsiness or sleep or profound torpor, lasting from about November to April. (2) A period of perfect wakefulness immediately following, during which the animal was emaciated, in poor coat, and with a general low vital

[1] The Dawn of History, p. 145.
[2] The Social Life of Ants, Int. Monthly, May, 1902.
[3] Animal Intelligence, p. 83.

capital, lasting for some weeks. (3) A period of improving condition, with good health and a desire to get free, which latter was also noted in the preceding period. (4) A period of maximum weight and vigor with perfect coat and an abundance of fatty tissue." This may perhaps be taken as the maximum of the winter sleep among mammals; among the amphibia it is more profound; while some animals present a less profound sleep, grading off to a period of drowsiness during the coldest weather.

The dwelling place of man is usually a storehouse for food. Home and food have grown up together and either word has come to imply the other.

The effect of food. The over-fed plant has been observed to produce an abundance of foliage, but little fruit. Spencer[1] thought that among social insects the sex was determined by the degree of nutrition while the eggs were being formed, other differences in structure among them being determined by the character of the food during the larval stage.

Among different insects it has been noted that during the summer, when food is plentiful, a predominance of females is produced, but on the approach of autumn, when food is scarce, more males are produced. Yung's[2] experiments on tadpoles was to the effect that when they were left to themselves the proportion of females was about fifty-seven in a hundred. Of three broods tried, the first fed with beef, increased the number of females to seventy-eight in a hundred; the second fed with fish brought the percentage up to eighty-one females in a hundred, and the third, fed with the flesh of frogs, produced ninety-two females and eight males in a hundred.

Ploss first noted the relativity of the births, as to sex, in Europe, and observed that when the harvests were poor more boys were born than girls. On this basis, Schenk[3] has endeavored to establish his theory of sex, believing that poverty of the harvest led to more of a meat diet, and that, therefore, is a factor for producing masculine offspring. He further believes that if he can control the diet for a period of three or four months previous to conception, he can control the sex. The economy of nature, in response to an over-abundance of food, would be an excess in the number of fertile females, tending to increase the number of that species to its food-limit.

Growth of the social instinct. The thread of love that kindled in the mother's breast of some low type of life widened in different directions, but first of all it was imparted to the offspring.

---

[1] Contemporary Review, Dec., 1893, p. 11.
[2] Geddes and Thomson: Evolution of Sex (quoted), p. 41-52.
[3] Determination of Sex, p. 221.

It grew from generation to generation until self-hood was recognized in like type and sociability made possible. This social instinct, if we may so call it, is found among the lowest forms, and may even have had its birth in the animal colonies, as the polyp or coral. But many of the free swimming marine forms of the same species unite in great number for search of food. Bluefish, salmon, herring, shark, cod, etc., travel and live in shoals. Insects migrate in swarms, as the locust, or butterfly; or live in colonies, as termites, ants, or bees. Birds, as terns, sea gulls, penguins, swallows, quail, crows, buzzards are sociable, and those that migrate collect in large numbers; even different species associate at this time[1]. Mammals, as deer, elephants, buffaloes, monkeys, live in herds; or horses, cattle, and sheep, in droves; or beavers and prairie-dogs in colonies. In fact, as Krapotkin[2] says, it is easier to name the exceptions among animals that do not live in associations of some kind than those that do. The cat tribe practically being the only exception. The teaching of Darwin was that "the struggle for existence" is inclusive and covers the whole field of animal life, activity and endeavor, and that associations of animals, of whatever kind, while they find pleasure in society and escape many dangers, is merely to carry on this warfare in a wider and a more perfect condition. But the fittest are also the most sociable animals, and sociability appears as the chief factor of evolution both directly by securing the well-being of the species while diminishing the waste of energy, and indirectly by favoring the growth of intelligence. Espinas, in his valuable contribution to the study of animal societies recognizes two kinds of social relations: (1) The organically connected colonies of animals, as the coral, (2) those associations whose origin is found in the desire for reproduction. The period of association varies in different animals, but for the higher vertebrates the existence of permanent bands and organizations becomes more frequent, and serve wider purposes.

Another condition of animal life now generally recognized by students of sociology is termed animal marriages. It represents the period that the male and the female of any one species live together. This may be for life as it is thought to be the case among some birds, as the bald eagle.[3] Among other species of birds it is kept up for one or more seasons. Since most of the birds live in pairs, Snider[4] recognizes in these unions the "first decisive instances of monogamy in nature." The mammals present less sharply defined traits for pairing

[1] Krapotkin: Nineteenth Century, Sept. and Oct., 1890.
[2] *Ibid.*
[3] Audubon: Birds of America, Vols. I & II, p. 60.
[4] Social Institutions, p. 124.

and many of them, while sociable, exhibit only a common interest in the welfare of the herd. They are for the most part, as the seal and many of the monkeys, polygamous. The higher apes and the gorilla, simang and orang-outang, show decided tendencies to live in pairs,[1] and to continue the family relation in bands after the young are matured.

The social nature of the animal, as thus briefly set forth, and his so-called marriage state, sets before us the basis for the social nature of man and the possibility of the permanence of the human marriage relations.

The social nature of the animal has found its supremacy in man, and the imperfect and irregular marital relations have found their permanence in the family. Marriage and family have grown up together, the permanency and the duration of the length of the union depending on the helplessness of the young, and the amount of care needed. No definite time, as the limit of the marital relations, could be adopted and no state of promiscuity as is now generally disregarded by recent writers, would be compatible for the proper care of offspring. The marriage relations is a growth from within outward, radiating ever about the one central point, the best preparation of the young to meet the requirements of the environment and to propagate the species.

Origin of marriage. Whatever may have been the form of primitive marriage is yet uncertain. Several of the older writers, as Morgan, Bachofen, and Lubbock, who made studies of primitive peoples, thought that a period of hetairism was the primitive state. But the prevailing opinion now, as shown by the works of Westermarck, Letourneau, Deniker and others, is that at no time was this custom prevalent to any great extent, and is not known to be practiced by any tribes[2] exclusively. The argument for this belief was based on the writings of Heroditus, Strabo, and Solinus, and an imperfect knowledge of the practices of primitive peoples.

Morgan[3] recognized five stages of the family in his classificatory system of relationships. This was based on a study of the Iroquois, and the stages were supposed to represent the growth of the family. The first was that of the consanguine family, founded upon the intermarriage of brothers and sisters. The second was the Punalian family founded upon the intermarriage of several sisters with each other's husbands, in a group; or in general a group of men were conjointly married to a group of women. The third was the pairing family,

[1] Snider: *op. cit.*, p. 126.
[2] Brinton: Religion of Prim. Peoples, p. 201.
[3] Ancient Society, p. 384.

founded upon the marriage between single pairs, but not exclusive, and continued during the pleasure of the parties. The fourth was the patriarchal family founded upon the marriage of one man with several wives and fifth the monogamian family or marriage between single pairs.

Bachofen[1] recognized; (1) a state of hetairism or promiscuity; (2) a matriarchate, the woman being the recognized head of the family; (3) a patriarchate, the father being the head of the family. For Sir John Lubbock,[2] the first state was that of communal marriage, the second was that of capture and the third was some form of exogamy.

The later writers, as Letourneau in his "Evolution of Marriage," recognizes polyandary as forming the lowest state. By capture and purchase there arose the monogamous; out of this also grew up polygamy. The highest form is that of monogamy. Westermarck[3] in his exhaustive study of the family recognizes polygamy as the earliest condition of marriage; through modification this passed into the monogamous form. The second type was that of polyandry which, through various agencies, also passed to the monogamous form. The views of the older writers have become more or less discredited as more exact information of the history and life of savage peoples has been obtained. The growth of the affections and some knowledge of possession, especially in recent times of property values have tended more and more toward marking off the individual and defining his mode of living. The basis for the marriage relation Letourneau[4] attributes to biological forces. "The institution of marriage," he says, "has no other object than the regulation of the sex unions." Others take a wider view and place on a more or less equal basis psychological, biological and social forces. Starcke's[5] conclusions were that a man connects himself with a woman in order that she may work and keep house for him, since as he thinks there was an early division of labor between man and woman, and second, that they may obtain children. The desire for children that he may live on through them and that they may be a support for him.

The development of courtship even among animals has a sufficient history to show that many psychic elements find expression in display and arts of various kinds. The extremes which this has taken among some animals is a proof that winning on the part of the male and selecting on the part of the

[1] Das Mutterrecht.
[2] Origin of Civilization, Chap. III.
[3] The History of Human Marriage.
[4] The Evolution of Marriage, p. 3.
[5] The Prim. Fam. in its Origin and Devel., p. 256.

female have been unconscious educating factors. Espinas[1] recognizes five kinds of intermediaries that are effective in sexual selection. They are: touch, smell, color and form; noise and tone; and play and motion. The mental effect of these play an important rôle among different animals. When all the factors are considered we cannot help but conclude that the psychic and social as well as the biological forces have all been important in the growth of marriage; the first two being the perfecting elements.

The Growth of Love. The female insect selects the place to deposit her eggs, the male, often insignificant yet necessary, may or may not attend her. The female fish selects the spot to deposit the spawn; this is true, with but a few exceptions, for the great body of fish life. Most nests are built by the female bird and only among the highest types does the male assist in the labor. Among mammals the female usually selects the site for the home. The female rabbit digs the little burrow in which her young are brought forth. Wherever the preparation for offspring is made the female takes the initiative. The human female, says Mason,[2] "more than all the rest created her home."

The females are smaller among many of the cephalopods[3] and some of the cirripods. Most female annelids are larger and certain articulates. The queen bee, hornet, and wasp are larger. Female butterflies are also larger than the males. The female of many fishes are larger, as in the cyprinoids, and also among reptiles. In nearly all birds and among all higher vertebrates the male is larger. As to the nurture of the young animals in general, Mrs. Blackwell[4] says, "no male of any species high or low is known to afford direct nutriment to the young—to first assimilate the food and then transfer it to the offspring," while the female always affords direct nurture. Women are considered less variable than men. They depart less from childhood in shape and disposition. Her thoughts are impelled by her feelings. Ellis[5] has observed that in males generally "there is an organic variational tendency to diverge and to progress, while in woman there is an organic tendency to stability and conservatism involving a diminished individuality and variability." Woman is further characterized as anabolic, to store up a reserve for the future need of offspring; while man is catabolic. They are longer lived than men and

[1] Die Thierischen Gesellschaften, p. 270.
[2] Woman's Share in Prim. Culture, p. 234.
[3] Delauney: Equality and Inequality in Sex, Pop. Science Mon., Vol. XX, pp. 184-192.
[4] Sexes Throughout Nature, p. 29.
[5] Man and Woman, p. 369.

more resistant to certain diseases, the variability[1] of man being accounted a sufficient basis for more marked pathological characteristics. Ellis[2] thinks that the longer life of woman marks the necessity for the care of the young.

Schäffle[3] pointed out the mental differences of the sexes. He characterizes woman as attaching her interest to the special and the individual, to the curious and the beautiful isolated phenomena. "It is feminine to desire to occupy with the whole personality a restricted sphere and to work in it with the most intense affection." The chief difference between the sexes, he thinks, resides principally in the feelings.

These distinctions, as above noted, represent some of the characteristics of the female. In part they have been instrumental in the development of the mother. The growth of love is a long history. The lowest forms are totally indifferent to kind or offspring; the gradual growth of inclination to care for eggs, to place them, to protect them, to incubate them; or if viviparous the offspring may depart unnoticed by the mother. No opportunity is given for the slightest responsive spark in its life. The real attachment between mother and offspring begins in the animal series when the mother begins to supply food, whether consciously or not, directly to the offspring. In the process of evolution, the supplying of food, at times, and even in the life of a species, may have existed as a reflex act. But if this were so when the object of her labors were removed, the habit so peculiar to the organism of the mother would be broken, and if it were possible this would awaken consciousness, if not of the loss of progeny, at least to a change of habit. Given the spark of attachment between mother and offspring, the flame has widened as though it were a great vantage field—which it really is—in the evolutionary process. A factor so useful that it has constantly tended to reduce the number of progeny necessary to carry on the species. With greater exertion of the parent, and a longer period of care has come greater opportunity for the growth of the bond uniting mother and offspring. Not only food and protection come to be provided by the mother, but comfort in different ways. These represent enlargements of the bond of sympathy as emanating from the parent. They also provide a wider field of stimuli calling forth a like response in the offspring. So in general the growth of the bond of affection between parent and offspring has increased *pari passu* with the amount of attention exercised by the mother.

---

[1] Ellis: Man and Woman, p. 369.
[2] *Ibid.*, p. 384.
[3] Small and Vincent: Study of Sociology, p. 180. (Summarized.)

The theme on which Drummond[1] wrote so beautifully was the evolution of the mother. The highest expression of which is found among civilized men. Characterized by patience, sympathy, carefulness, and devotion, she becomes the perfect "tutor of the affections."

The period of infancy was pointed out by Fisk[2] as having a wide meaning in the evolution of the race. He thinks that while this alone makes possible the education of the sentiment of love, it has also created man's social nature, and fits him for living in societies. A few instances will point out the significance of this period. The offspring of the ungulate or hoofed animal is able to walk almost as soon as born. The weasel or the badger[3] are blind for a fortnight after birth and stay with the mother for two months or more.

According to Wallace[4] the orang-outang attempts to walk at the age of about one month, and lifts itself up by holding to objects. Previous to this time it lies on its back, helpless, rolling from side to side. It tries to grasp but is scarcely able to guide its fingers. The babe, the most helpless of all young, begins to walk at from twelve to fifteen months, and needs at least eight years of care. The brain, according to Sharpley,[5] on the average, weighs fourteen ounces, while the weight of the entire body of the infant on an average is six and one-half pounds. Yet with this proportion of one-seventh of the organism as brain weight the infant at birth is far behind the ungulate in the ability to even survive. The marsupial young are brought forth at a very immature stage, and the external development is completed in the pouch with which the mother is provided. The period of gestation for the herbivora is much longer than for the carnivora of equal weight. The gestation period for a wolverine[6] and a sheep, of approximately the same weight are respectively 90 and 150 days, yet the lamb may be able to walk a few moments after birth, while the wolverine young are helpless. The significance of the nest becomes apparent. The longer period of gestation in the one case has developed the nervous system to such a stage that the instincts are ripe to assert themselves. The kangaroo transfers, as it were, its womb to the exterior part of its body. The undeveloped nervous system here completes its growth. For the mammal the nest serves a similar device; for man it is the home.

---

[1] The Ascent of Man, p. 267, *et seq.*
[2] Cosmic Philosophy, p. 343.
[3] Sutherland: Origin and Growth of the Moral Instinct, Vol. I, p. 90.
[4] *Ibid.*, p. 96.
[5] *Ibid.*, p. 82.
[6] Malay Archipelago, p. 35.

The period of helplessness is the opportunity for the mother. Her fund of feeling finds expression in a thousand ways. Scott[1] thinks that care for the young "grows out of the care of the individual for its own body, and that the offspring which has been for a time a portion of herself, is defended by the mother with a fervor which arises almost directly from the interest of self-preservation."

Among some animals care may be prompted by a desire to get rid of the uneasiness caused by overburdened udders. "The unrelieved pressure in the mammary gland of a mother animal robbed of her young," says Geddes and Thomson, "is no doubt largely concerned in prompting her to adopt young ones not her own."

In regard to care, and especially the period of infancy, Fisk[2] noted that in general the "duration of the feelings which insures protection of the offspring is determined by the duration of the infancy."

Responsive expressions are peculiar to childhood and especially among girls. Children's games and plays are manifestations full of the growing affections. Dr. Chamberlain[3] has summarized some of the playthings among different peoples. This shows how widely dolls are used by children. The "Study of Dolls," by Dr. Hall,[4] brings to light an unfolding process in child-life. The food they are supposed to need; the names for them; the need of sleep; the sickness, the death, the funeral, the burial; these may be taken as expressions of growing sentiment that have developed in response to the mother's care.

Kline[5] in his study of migration cites the following as some of the factors making for love of home, as shown by questionnaire returns.

(1) F., 19. "I think that the order is mother first, father and brother equally. I love to think of my surroundings at home in this order: the sitting-room, the two maples in the yard, the brook and the surrounding hills."

(2) F., 20. "The elements in my own love of home are first my father, then sister, brothers, the house, and familiar spots on the farm."

(3) F., 17. ". . . . Father and mother and next my sister and brother . . . then the home feeling which I have but which I cannot possibly explain."

Forecast. The number of offspring has constantly shown a decrease with the growth of love and care for them. But this

[1] Sex and Art., *Amer. Jour. Psy.*, Vol. VIII, p. 171.
[2] Cosmic Philosophy, p. 343.
[3] The Child in Folk-thought, p. 216.
[4] *Ped. Sem.*, Vol. IV, pp. 129–175.
[5] *Amer. Jour. of Psy.*, Vol. X, p. 66.

has not ceased with the progress of civilization. Indian women have rarely more than four or five children. Westermarck[1] thinks this holds good not only for the North American Indians, but, upon the whole, for a great many uncivilized peoples. Among civilized peoples increased responsibilities imposed by high standards of living cause a decrease in the number. In the United States,[2] for the year 1850, the average size of the family was 5.94 persons to each dwelling in the country, while for 1890, there were 5.45 persons. This shows a decrease for the entire country, but for the urban population alone the decrease is much more marked than for the rural population.

The country in which the decrease is most noticeable is France[3], where the ideal family consists of two children. The desire of the parents is that the marriage dowry may be sufficient for comfortable living. This is especially true for the agricultural class, the family consisting of a boy and a girl, the income from the respective dowries received will not be reduced below that of the parent.

Among infants the death rate is very great, more than ten per cent. of them dying before they are one year of age. Among savage races this is especially large. Pava has noted the inadaptability of the child for digestion. The alimentary canal is short, and no saliva is present. The food of the mother and the newly born child should be the best. This is often poor among savage races, and the hardships are often extreme. The improved condition of home life has had its effect in bringing better sanitary conditions. Wright[4] says "It must be conceded that if a decrease in infant mortality is the result of more concentrated care upon the few, then the smaller family is more effective in society than a large one neglected. Certain it is that the average duration of human life has been increased at least ten per cent. under modern civililization."

Of the three elements of the mind, feeling and sympathy are primordial in their development. These are the characteristics of motherhood. Modern civilization, with the great store of tradition and learning, impose new conditions on the individual. Cognition tends to be supreme and feeling the virtue of femininity is subordinated. The conditions of true motherhood are imperiled by the transition from the sphere of feeling and emotion to that of cognition. The question raised by Griggs[5] is whether the biological basis of human existence is a sufficient

[1] The History of Human Marriage, p. 491.
[2] Wright: Outlines of Sociology, p. 42.
[3] Demolin: Anglo-Saxon Superiority, p. 94.
[4] *Op. cit.*, p. 68.
[5] The New Humanism, p. 213.

foundation for the vast superstructure of life. Higher education of women brings this danger to the home.

Another danger that Bryce[1] thinks higher education brings for the home is individualism. That is the desire of each person to do what he or she pleases, to gratify his own or her own tastes, likings, and caprices; to lead a life which shall be uncontrolled by another's will. The nervous system grows more irritable, he thinks, and there is greater friction, and for this reason temper is a growing cause of menace.

Wake[2] notes, also, "that as a result of the development of the intellectual faculties which constitute the chief element in individuality, the desire to escape the cares of a family may lead to disinclination for marriage, if even there is not a repugnance to it." Carpenter[3] in reflecting on the course of evolution and the voluntary sterility of certain classes of society women, remarks that "sometimes it seems possible that a new sex is on the make—like the feminine neuters of ants and bees—not adapted for child-bearing, but with a marvellous and perfect instinct for social service, indispensable for the maintenance of the common life."

In regard to society as a whole it tends more and more to the feminine type. The community of savage[4] life approaches the masculine, selfish, unstable, variable. With no fixed abode they roam about from place to place, killing and destroying; warfare is their glory. Woman's influence comes to exert itself to a greater extent with the growth of civilization. Who can estimate the effect of the female teacher in the schools, in helping to civilize the race and in bringing to compromise the variable nature of man? It is like an extension of motherhood, throughout all the earlier years of life. In regard to the duration of life, Weismann's idea is to the effect that the increase in length is exactly proportional to the time which is demanded by the care of the young. With the development of civilization new conditions are imposed upon the young, these require a longer period for preparation and tend to increase the period of helplessness. Corresponding to this we should expect an increase in the length of life, which as above noted we find. If from this brief study of the conditions of home we should venture any forecast as to the course of the evolutionary process, the evidence would seem to indicate that whatever infinitely small changes are taking place in shaping the destiny of the race no small amount of this force lies along

[1] Studies in History and Jurisprudence, Vol. II, p. 463.
[2] Sociology—Brooklyn Ethical Asso., p. 69.
[3] Love's Coming-of-Age, p. 67.
[4] Morley: Life and Love, p. 200.

lines that tend to the care and comfort of the race. The influence of the mother is yet a great factor in progress.

The writer desires to acknowledge his indebtedness to President G. Stanley Hall, under whose supervision this work was done, for many valuable suggestions, and much of whatever merit it may contain is due to his wise counsel. He also desires to thank Dr. Sanford and other members of the faculty of Clark University for their kind assistance.

PEDAGOGY IN OUR COLLEGES AND UNIVERSITIES.

A. J. KINNAMAN.

In the year 1832–33 Dr. Gallaudet occupied a chair of Philosophy of Education in the University of the City of New York, now the University of New York. This undoubtedly was the first professorship of its kind in this country, if not in the world.[1] The chair appears to have been discontinued after one year. Brown University organized a "Department of Pedagogy" in 1850, which, however, was discontinued after a period of five years. A course of lectures on pedagogy was given in Michigan University in 1860 by Professor John Gregory. The course is said to have occupied several weeks and to have included: educational philosophy, the grades in education and the teaching art.[2] Again in 1870, Iowa University offered a course in pedagogy and conferred the degree of bachelor of didactics upon those who had completed a one year's advanced course in the elementary normal department and who had taught two years successfully. In 1873 Iowa University[3] organized an advanced normal course open only to the academical seniors who intended to become teachers and to special students who might be qualified to be classed with them. Its "College of Normal Instruction" was opened in 1878, a sort of rudimentary, post-graduate professional school, granting the academic normal degree of bachelor in pedagogics. The work was conducted by Dr. N. S. Fellows, and included: history of education, national systems of education, practical educational topics, school economy and principles of education. Finally, Michigan University, in 1879, founded a "Chair of Science and Art of Teaching."[4,5] This course was extended over two semesters. Ten hours a week was devoted to it.

From this date to the present time the number of colleges and universities offering courses in pedagogy increases rapidly. In 1883–4 there were seven such institutions.[6]

---

[1] Jerome Allen: Education of Teachers in the State of New York, p. 271.

[2] U. S. Com. Rep., 1879, p. lxxx.

[3] Education, Mar., 1881.

[4] U. S. Com. Rep. of Ed. I, 299.

[5] U. S. Com. Rep., 1883–4, p. cxv.

[6] U. S. Com. Rep., 1883–4, p. cxiii, and F. W. Atkinson, Professional Preparation of Secondary Teachers in the United States, Leipsig, 1893, p. 38.

There were, in 1892–3, 83; in 1893–4, 174; in 1896–7, 220; in 1898–9, 244. According to the commissioners report for 1898–9 there are still, however, 250 colleges and universities in which no courses are given in pedagogy.

This movement has not come without its struggles and opposition. Its various disciplines were so imperfectly developed and organized that it could not command respect and recognition equal to that of other subjects. In a period of rapid scientific advance it had no body of scientific investigation back of it, and its advocates were dealing in platitudes. Most books on the subject consisted of "barren details of organization and method, and the description of the inferior teachers and schools." Such work was new and untried in these institutions. But few men cared to undertake to teach it, and others deliberately opposed. There were wanting young men who would devote themselves to pedagogy. Courses of study were lacking in general culture value. The pedagogical courses were too short to command respect. Often special degrees were given for too limited a term of student work. The occasions for opposition were numerous and grave, but the cause was genuine and sure to succeed.

One of the earliest references under the term *pedagogy* in our Commissioner's Report appears in the publication for 1874, where there is given a report from the Allgemeine Schulzeitung, of Jena, listing the lectures on education (pedagogics) at the German Universities during the winter of 1874–5. A similar report is given for 1877. Here it is said (p. lxxiv): "The science and art of teaching is surely a subject so important that it may well be included in the curricula of our universities and colleges." After mentioning the chair at Iowa State University, its example is recommended as worthy of imitation. There is added: "the attempt to establish chairs of didactics has been embarrassed by the historic customs of our older colleges. Again, "it is not too much to hope that another result will be the more careful consideration of the philosophy of education and adequate provision for the round and thorough teaching of it."

About this time Prof. N. S. Fellows published two articles in the Educational Weekly of Chicago urging the establishment of chairs of didactics in our colleges and universities. His reason for such statements are: It will (1) greatly assist the graduates who, from their superior culture, will occupy chief places and become teachers of teachers.

(2) A reflex benefit will accrue to the colleges themselves, in the greater success of their graduates and in improved methods of their own work.

(3) Professional educational literature will be improved.

(4) The development of a true science of education will be promoted.

(5) It will be a deserved recognition by the highest educational authorities of the value and need of professional training for teachers of every grade.

(6) Teaching will more justly merit the title of a profession.

(7) Higher institutions will become more closely united with our public school system.

(8) It will increase and widen the knowledge of ends and means of education among those who, though not teachers, will hold high official and social positions.

The next important reference occurs in the report for 1883–4, p. cxiii, where after naming the institutions having chairs of pedagogy, it is said that Johns Hopkins University has in various ways made its influence felt upon the teaching profession, and its work in this direction promises to be greatly extended through the lectureship of psychology which has been accepted by G. Stanley Hall, Ph. D. The lectures on education referred to were given on Saturdays, and were patronized largely by students from other departments. Lecturers from other departments were called in to discuss the teaching of their own subjects. The great difficulty was to find young men who would devote their time to the work. It was impossible to arouse interest enough even to have the subject elective as a minor.

On page 381 of the Commissioner's Report, for 1887–8 one paragraph is devoted to "Chairs of Pedagogy." "First in order among the demands for providing professional training of teachers, though not the most important, is a Chair of Pedagogy in the State University." McGrew recommends them as of inestimable value to the public schools. Heston, of the Pennsylvania State College, urges them for training competent superintendents and normal school professors; and James, of the University of Pennsylvania, for supplying teachers for our higher schools and colleges.

In the report of 1889–90, p. 1017, when there were about 70 institutions offering courses, it was said that the pedagogical courses had so few elements in common that it was difficult to generalize about them. "Some universities have complete courses in pedagogy, whether graduate or undergraduate, while others make it an elective study for juniors and seniors in the regular college courses." Again "some recognize that the person who intends to teach should have instruction in matters and in methods that the candidates for the degree in arts or sciences does not receive." Thus in 1889–90 we find an attempt "not to recognize education or pedagogy as a

science, as political economy or politics under the name of sociology has been recognized, but it is certainly placing pedagogy on the same footing as those subjects."

At that time it was possible to make two classes of universities with regard to the courses in pedagogy. (1), those, like Harvard, which emphasized special methods as in Latin and mathematics, and those which, like Clark, emphasized research work and the more general aspects of the science of education. Harvard, did, however, propose a course of more general character on "the history, theory and art of teaching." Lectures were given once or twice a week, and the student was required to write an essay or two and to observe schools. The course was devised especially for the benefit of teachers, but the general attitude of the university rather discouraged its pursuit.

Clark declared at that time that their work was primarily shaped to meet the special needs of two classes, one composed of those desiring to qualify themselves for professorships of pedagogy in universities, colleges or normal schools; the other class, composed of those who intend to become superintendents of state or city systems of education or wish to fit for other administrative positions. Its courses then included comparative pedagogy, social effects of higher education, the effect of the artificial or intellectual development of the child upon his natural or physical development and special pedagogy. There were, also, courses in neurology, experimental psychology, anthropology, practical ethics and philosophy.

Iowa was at this time giving three courses of one term each; history of education, educational sciences and systems, and school management and exemplifications of methods of instruction. Tennessee proclaimed her course to be beyond the normal course, and was one of the first to put forth a strong claim for the culture value of the work. Cornell, Columbia, and Princeton had courses or "quasi courses in pedagogy."

The school of Pedagogy in the University of the City of New York, now New York University, was organized about this time, 1890. The faculty holds the same relation to the university as the faculties of law, medicine and theology hold. The special plea is that the training of the teacher should be placed on the same level with the training required for other professions. They granted two degrees: Master of Pedagogy and Doctor of Pedagogy. The courses covered, (1) history of education, (2) psychology and ethics, (3) pedagogy, methods and school hygiene, (4) literature of pedagogy and æsthetics and (5) educational systems of other countries.

President Elliot in 1891 said, "The faculty of Harvard, in common with most teachers in England and the United States, feel but slight interest or confidence in what is ordina-

rily called pedagogy: but they believe that skillful teachers should be able to give some account of their methods for the benefit of those who are beginning to teach; or, in other words, that experienced teachers can advantageously convey to beginners some of the results of their experience. The faculty believe, however, that the work to be profitable, must be departmental; that the accomplished teacher of Latin must show how to teach Latin; the accomplished teacher of chemistry, how to teach chemistry, and so forth; or at least, that there must be separate teaching of the several methods applicable in the principal groups of subjects—language, history, science and mathematics." Such a plan may be valuable for converting a faculty to a recognition of the value of courses in pedagogy, but it can never give the subject any adequate representation in any university, let alone a great institution like Harvard.

As has been said, then, we have at present 244 colleges and universities offering courses in pedagogy. Of these Clark University, alone, has established a department of higher pedagogy whose chief aim is research and contribution pedagogical literature by the Faculty and the men in attendance. The institutions offering the most extensive courses are Clark, Columbia, Chicago, California, New York, Illinois, Iowa, Cornell, Harvard, Leland Stanford, Jr., Michigan, Syracuse, Texas, Minnesota, and Toronto, Canada. Possibly a few others should come in this list and one or two should be omitted, but there is no hard and fast line of division. Besides these we have some twenty-five institutions offering less formal work, consisting usually of a few special lecture courses, and the conventional courses of regular instruction in the history, philosophy, science and art of education, pedagogy and hygiene, mostly described by blanket terms allowing a wide range of work. Some research work is done, and it differentiates itself from normal school work in the omission of all academic branches and in the absence of student teaching in a model school. It is quite impossible to describe the remaining 200. The work done in them ranges from the very poorest to the very best, but is always limited in extent, number of instructors, access to libraries and literature; and no attempts are made at research work.

Taking the more formal courses from the leading institutions they appear under a great variety of headings; but the topics almost invariably announced are: organization and management, school systems in various countries, history of education, school hygiene, psychology, educational reformers and educational classics. Other topics announced in these leading courses are: introduction to educational theories, ele-

ments of pedagogy, institutes of pedagogy, elementary pedagogy, history of educational thought, educational classics, educational aims, history of philosophy, character and its culture, æsthetics in education, sociology in relation to education, high school pedagogy, high school work, recent movements and problems, anthropology, biology and neurology, ethics, educational uses of domestic arts, nature study, adolescence, method of the teacher, method of the subject, art of education, evolution of educational theory, principles of education, educational theories, educational reformers, philosophy of education, educational foundations, practical pedagogy, and child study. The following have been proposed as general culture courses, from which students not intending to teach might elect: character and its culture, æsthetics in education, sociology in relation to education, Plato's Republic, Grecian education, famous men and their education, elements of great teachers, the pedagogy of Shakespeare, and the pedagogy of Jesus.

I have selected twenty-two colleges for classifying their instructors, the relations of their pedagogical work to the remainder of the work in the institutions and the degrees conferred. The institutions selected are, Minnesota, Michigan, New York, North Western, Cincinnati, Missouri, Toronto, Brown, Illinois, Syracuse, Ohio, Nebraska, Leland Stanford, Jr., Wisconsin, Chicago, Cornell, Clark, Harvard, Columbia, Iowa, California, and Indiana.

These institutions employ seventy-eight men as professors of pedagogy. When classified according to the degrees they hold, which is not a very good basis of classification, but is the best available, the following are the results: Ph. D. 39; LL. D. 4; A. M. 8; Paed. D. 3 and M. D., D. D., S. B., Ph. B. and L. L. B. one each, and nine not determined. Taking the department of Physics in the same institutions as a department fairly well organized and differentiated with which to compare, the following is the result: men employed 113; Degrees, LL. D. 1; Ph. D. 42; A. M. 17; A. B. 10; M. S. 5; B. S. 15; M. M. E. 2; Ph. B., C. E., B. M., E., M. E., Sc. D., M. Sc., and B. E. E. 1 each, and fourteen not determined. Thus, while a larger per cent. of the pedagogues (50%) have the Ph. D., the per cent. of physicists holding baccalaureate degrees is about ten per cent. greater.

In the twenty-two universities there is one School of Pedagogy on a par with the Schools of Medicine, Theology, etc.; ten departments of pedagogy; four called courses; five in which the course is a part of the department of Philosophy, and one a part of the Department of Psychology.

The credits given vary considerably. There are four which merely allow the student some credit for work done in peda-

gogy; sixteen allow the student to offer a major in the department, seven grant teachers' certificates when the student gets his degree, and two give certificates of study. As to degrees granted when the student majors in the department it appears that one gives Ph. D., two give Paed. D. and Paed. B., and twelve the A. B. The showing is by no means all that could be desired, but I believe it better than is generally supposed and that the indications are rather favorable, considering that the movement is yet new.

Early advocates for departments and chairs of pedagogy in our universities hoped that their establishment would result in an improvement in the quality of pedagogical literature. It is rather early to expect extensive permanent products, yet the research work done at Clark and published in the *Pedagogical Seminary*, now extended to eight volumes, is an innovation of inestimable value. No substantial history of education has resulted, having the broad culture value of our general history. Monroe's Source Book and Russell's Higher Schools in Germany are worthy of honorable mention. Some of Dr. Dewey's work, Bryan and Harter's Hierarchy of Habits and a few others may be traced more or less directly to the inspiration of schools of pedagogy. That there is a field here for research and historical investigation is established beyond doubt. That its disciplines have positive culture values, as proclaimed by Tennesee, is recognized as never before. That the character of the course should vary with the character and grade of the institution offering it I believe should be fully recognized. I believe that our greater institutions where research work is carried on in other departments, should offer facilities for research work in this department also. The minor institution can have enough illustrative research to enable the student to appreciate its methods, problems and results. In a few of our best institutions we need courses for graduate students only where research work and the development of a genuine literature shall be the predominant feature.

In a large range of institutions just below these few leading institutions the tendency seems to be to differentiate the department of pedagogy and to secure a state teacher's certificate for those who major in the department when the baccalaureate degree is taken. I believe these to be desiderati but that they are fraught with dangers to be guarded against carefully. In differentiating there is danger of losing the proper close contact with other and closely allied departments as philosophy, psychology, anthropology and biology. By the very nature of the case the proficient teacher of pedagogy must be conversant with what is to be taught, and complete differentiation is probably suicidal. As for certificates, whenever the

State is to grant them, it should require only a minimum amount of work but never specify just what is to be done. With the present rate of development of this department in our universities, boards can hardly meet often enough to prevent their injuring the work by limiting it, however good they may be.

The practice school it seems to me is quite out of the question, unless the course is to take the place of the work of the Normal School. But our experimental and observation schools are all but indispensable for the higher professional and research schools.

Despite opposition, misunderstanding, defective disciplines, poorly organized courses and instruction, the movement has grown marvellously in the last fifteen years. Nearly all of our larger institutions now have some kind of work in education or pedagogy. The increase in number of institutions offering such courses cannot be so rapid in the future. Improvement in the near future will probably lie (1) in the differentiation of the functions of the courses and methods for the normal schools, and for the colleges and universities, (2) in the establishment of model and experimental schools, (3) in the extension and the improvement of the existing courses, (4) in determining the relation of this department or line of work to the other courses and departments of the university, (5) in the preparation of specialists for the work, (6) in the improvement of the disciplines, by experimental and scientific investigations, and by collating and unifying the data already at hand, and (7) in demonstrating the high culture value of its disciplines.

CHRISTIANITY AND PHYSICAL CULTURE.[1]

By G. Stanley Hall.

Health means holiness or wholeness. The words healthy, holy, hale, heal, and whole all come from the same Anglo-Saxon root. Physiological psychology is now restoring this deep philosophy embedded in the words. In its light let us re-translate some Bible texts—worship the Lord in the beauty of healthfulness; healthfulness becometh Thy house O Lord; serve Him in healthfulness; preserve my soul for I am healthful; this is a healthful man of God; the healthful Scriptures, the healthful day, spirit, people, etc. This sums up the new hygiene in the blessed revival of which it is our privilege to live, and which is rescuing man's body from the still persistent traces of the old ascetic neglect. Ask with reverence, what shall it profit a man if he gain the whole world of wealth, knowledge and power, and lose his own health; or what shall we give in exchange for health? Without it, the mind tends to grow feeble; the will to be freaky; the heart to lose its courage; virtue to be exotic or a pale cellar plant; and the human brain, the very highest and most complex product of the great biologos in the world, the only mouthpiece of God through which alone he has revealed himself, to become anemic and languid. Jesus is the healer or whole maker, who came to purge the world of sin and disease and give us the soundest hearts and souls in the soundest bodies.

One of the best products of health is abounding joy or euphoria, such as we feel in the rapture of just being alive on a spring morning, when we overflow with the superfluous energy that makes the play spirit in the world purge away the primal curse of work and gives a buoyancy that no pain and affliction can entirely overwhelm. This holy or healthful joy is the end toward which creation strives and is the raw material out of which the special and lower pleasures of sense, of wealth, discovery, gratified ambition and art, are made. Educational and even religious systems are thus measured by the health, wholeness, and holiness they can produce.

Chief among the controllable means to health is wise muscle

[1] Address before the International Meeting of the Y. M. C. A., Boston, 1901.

culture. By weight the adult human body is nearly one-half muscle. The muscles are the only organs of the will and are likely to share its strength or weakness. Muscles have done nearly all man's work in the world. They have tilled the soil, built cities, fought, written all the books, and spoken all the words. Through all the past man has been the striver and toiler. There is a sense in which all good conduct and morality may be defined as right muscle habits. More than this, just in proportion as muscles grow weak and flabby, the chasm between knowing and doing the right, in which so many men are lost, yawns wide and deep ; and as they become tense and firm doing becomes—as F. W. Robertson was wont to say it should—the best organ of knowing. Rational muscle culture, therefore, for its moral effects, often for the young the very best possible means of resisting evil and establishing righteousness, is the gospel, I preach to-day, a gospel so reinforced by all the new knowledge we are now so rapidly gaining of man's body and his soul, that it is certain to become a dominant note in the pulpit itself, just in proportion as those whose vocation it is to save souls realize that they must study to know what the soul is.

But, alas ! how much there is now in modern life that makes for decadence and degeneration of both muscle and health. The city, that great "biological furnace," a new and perhaps chief feature of our day, so contrasted with that of the country where alone man can be fully natural ; sedentary life in office and school that favors attitudes of collapses ; that reduces the action and even the volume of the lungs and stomach ; that is so hard on the heart—itself only a muscle—and the blood vessels, the health of which is so all conditioning ; the restriction of the eye, which normally roves freely far and near, to the monotonous zigzag of the printed page, and as the progressive increase of its defects are shown in the saddening statistics ; the pallid, muddy or chlorotic complexions, stoop, decaying teeth, premature grayness and baldness ; the great increase of nervous disorders ; and added to all these, the use of machines which are now suddenly exempting human muscles from the strenuous life which developed them and to which they have been wonted for generations ;—this is the situation. But this is not all. We are now coming to know the age of adolescence from the early teens into the early twenties, and we find that one of its chief features, when normal, is muscle growth. It is the age of nature's majority, when the young leave home and begin the great struggle for individual existence. Muscles should now grow both in size and power as never before or after. It is their nascent period of now or never, and should be sacred to their culture for the sake of will and virtue. It

is also the age when the strongest of all human passions develops, which exposes it to the greatest of all temptations to sin, and the chief preventative measure to sexual vice is now physical training.

Its neglect is never so dangerous. Careful research shows that the difference in the strength between the weakest and the strongest youth is twice as great in the later teens as in the earlier, and this difference is largely determined by use or disuse. Licentiousness almost immediately reduces strength in a surprising and measurable degree, whereas abundant physical exercise uses the available energy of the body in healthful ways, and reduces temptation in almost inverse ratio. Not only strength, but circulation or irrigation of the tissues with blood is most variable at this age and most dependent upon regimen. Without abundant exercise, the heart which should grow very rapidly in both size and power, remains both small and weak, as does the caliber of the great arteries.

Now physical achievements fire the heart of youth in a way which adults who have not experienced it, find it hard to appreciate. To be "great with hands and feet," an ideal which inspired Pindar who sung the achievements of the Greek athletes, brings just those fervors, calentures and enthusiasms, which are the chief need of youth. Youth must be intense; must tingle and glow; have excitement; stretch lungs, blood vessels, muscles to their greatest capacity by warming up and getting second breath for both mind and body, and this makes for righteousness, because it lessens the power of sin over body and soul.

I have thus stated the need and defined the goal, and now I am called in as an expert, sympathetic but outside enough of the movement to be impartial, to report on the past progress and present state of body training in these Associations. I find that since 1869, when the first gymnasium was opened in New York, over 475 equipped gymnasia, training more than 86,000 young men, have been established in the 610 city or large town associations of the country. Slowly and in the face of much early lack of appreciation and even prejudice and despite many obstacles, the new problems, some of them at first discouraging, have been one after another solved. Physical trainers, at first sometimes chosen from bad surroundings of circus and professionalism, have been trained; well-manned institutions established for this special purpose at Springfield and Chicago; summer sessions, camps and conferences held for further training of leaders; courses of study extended; methods of physical examination steadily improved; experts like Roberts and Gulick, known and honored leaders wherever physical training is studied, and more lately the athletic league of over

100 associations, to still further unify and perfect the work. Among all the marvellous advances of Christianity either within this magnificent organization or without it, in this land and century or any other lands and ages, the future historian of the church of Christ will place this movement of carrying the gospel to the body as one of the most epoch making.

The German Turner system, which sometimes brings 5,000 trained men in the field in this country, exercising in uniform under one command, has been one of the most potent allies of patriotism in the German Fatherland, and for nearly three generations has contributed to improve the bodies and increase the national strength under Jahn's inspiring motto, "only strong muscles can make men great and nations free." For two generations the Swedish system, less national, more specialized, scientific and governmental, has given heart and life to another great racial stock. The English method of play, sports and games expresses the brawn and brain of English life and is both cause and effect of much that is best in our mother country. We seek to combine the spontaneity of the Anglo-Saxon body cult; the science of the Swedish; and the love of country which inspired the Germans, but our loyalty is to a kingdom invisible, not made with hands. The watchword *frisch, frei, froelich, from*, shows the dimensions of this all-round movement. We are soldiers of Christ, strengthening our muscles not against a foreign foe, but against sin within and without us. We would bring in a higher kingdom of man, regenerate in body; make it more stalwart, persistent, enduring, taller, with better hearts, stomachs, nerves, and more resistful to man's great enemy—disease.

To one thing I exhort every man and woman who hears my voice. As you, and you, and you, are Christians, live up to the top of your condition; cultivate an appetite for food that is a physical conscience trained to point true to the pole of the needs of the body; train a little every day keeping well within the limits of your vitality and with careful adjustment to your power to recuperate from fatigue; consider your posture, carriage, bearing, and regimen; if you are young learn, if you can and have not, to run a little without initial embarrassment; work or play actively enough every day to draw away the blood from the centers of congestion; study dosage a little or the effects of the same exercises in large and small quantities; if you work with the brain, avoid exercises that involve spurtiness, close attention, or that throw the strain on the nerves. Remember that nowadays at forty, most men are either invalids or philosophers—invalids if they have done their work wrongly or are burned out with vice, individual or hereditary, and philosophers if they have had the rare insight

to learn to know themselves so as to keep completely well. It is said of the great thinker, Kant, that he prided himself more upon keeping his frail body alive till eighty, and getting so much work out of it, than upon writing all his volumes. Try these things yourselves faithfully, and you will begin to feel within you this new gospel of the body, the light of which is now being shed abroad in the world as never before.

Men are, happily, just now beginning to learn what a power can be brought to bear against the kingdom of evil in the world by right body keeping; how the body can be built up by patient attention; how we can develop the large fundamental muscles that move the great joints, and as it were lead the energy thus generated down and out to the finer muscles that move the face, vocal organs, fingers, and do the work of skill and precision in the world; how we can give rhythm and cadence to the whole soul life by well adjusted movements, and as it were, like some of the Bible heroes again dance before the Lord in worship; how curative of disease and corrective of deformity well prescribed gymnastics can be; how active muscle habits develop a love of nature and teach sentiment which is sometimes prone to go to waste in gush and vapid enthusiasms, to harness itself to do the work of the world; and what a sin and shame it is when our temples of the Holy Ghost are neglected and lapse to premature decay.

Finally, this is a world and age of achievement. Men are coming to be measured more and more not by what they know or even what they feel, important as that is, but by what they can do and actively accomplish in the world. Knowledge can never save individuals or nations. Subjective emotions are not enough. But there is one language and one only of complete manhood, and that is willed action, and it is to make our lives speak in this language and thus to make them historic that we train, what psychology now sees to be the chief power in man, the will, the only organs of which are muscles.

PRE-ESTABLISHED HARMONY.

A MID-SUMMER REVERY OF A PSYCHOLOGIST.

One raw cold day in January just before nightfall, Professor Hardipan, of Boston, was walking slowly and abstractedly from his laboratory to his lodgings, nearly a mile distant. He was a somewhat hard-headed, positivistic man, on the shady side of forty-five, who had already won a very prominent place in the scientific world. He was a psychologist of the empirical, experimental school, interested in human nature generally, and especially in everything that was exceptional and out of the way. He had frequented prisons, asylums for all sorts of defectives, was very fond of studying the ways of animals, somewhat bluff in his manner and perhaps a trifle crabbed in his disposition. He was an incorrigible old bachelor, a member of a club of plain speakers, devoted to roasting each other, and was past president of the *nil admirari* club. He had long ago eschewed society but had a rather strange foible of reading, thinking, and speculating about marriage and woman in general, and was widely read in all sorts of statistical, physiological and sociological literature bearing upon the subject. His friends in whose presence he occasionally vented his views about doubling man's rights and halving his duties feared he was almost in danger of becoming a woman hater, yet he was at bottom a good hearted man, a fast and true friend, and some of his blunt and *outré* notions were thought by those who knew him best to savor of affectation.

He wore a heavy, dark fur overcoat buttoned with loops, and carried under one arm a portfolio of charts and a few books, and a case containing a physiological instrument in the other hand. The snow was very deep and a fresh storm was evidently just beginning, and where the snow had not blown from the icy sidewalk it crunched under foot with a dry, crispy noise, the cause of which he had investigated in a special memoir. His thoughts were busy, quickened by the frosty, gusty air, and he was annoyed at the crowd of shop girls who just after the closing hour thronged the streets on their way home. He finally struck out into the open common which became more and more secluded the farther he penetrated it, and soon found himself in one of the narrow and unfrequented walks near the center of it, where the snow had been shovelled

for many a rod into a high wall on either side, when suddenly he became aware of a lady walking rapidly in the opposite direction. He observed that she was absorbed in a revery of happy mood for she seemed in the dim light to smile to herself quite unconscious of his approach. Just at that point the snow, that had been melted in the sun on the north side, had frozen so as to make the pathway much higher upon that than upon the other side. He was not a gallant man, and with his head bowed continued doggedly upon the lower side, characteristically slackening his pace for her to pass. This she would have done readily enough had not the ice upon the upper side, which he left for her, been as smooth as polished glass, so that she slipped suddenly back transversely to his side of the path so close in front of him that the bobbing feather of her hat actually tickled his nose and he felt her warm breath for an instant upon his cheek. Not for many a long year had his lips been so near a girlish face. As she stepped quickly back he observed in the gathering night that she was fair, fresh and young, and that she was blushing crimson at the awkward accident.

Professor Hardipan had been brought to a full stop, but with characteristic promptitude and a natural attempt at gallantry he bravely stepped up to the slippery side with a sudden spring that would have carried him safely round her where she stood, so that each could have gone on their way had she not stepped quickly back half frightened by his sudden spring. Thus it came about that as he glided down to the lower side as she had done instead of having passed her, they were again as before, face to face. The books under his arm had gently touched her shoulder almost like a good natured and confidential nudge in the ribs, and she got the peculiar odor of the laboratory that always enveloped his person like an aura and even smelled the cigars in his vest pocket, that for an instant were not six inches from her pretty nose. Had not her muff and the professor's box acted as a buffer, their proximity would have been still closer.

They stood thus but an instant, when by a simultaneous and natural impulse they both sprang with a strong impetus to the steep side, each with the design of allowing the other to pass with a wide berth before the inevitable slide. So exactly together was this design conceived and executed, however, that there was a square collision at the top and both slid slowly down four feet face to face to the other side again. In the instinct of saving herself from a fall, she automatically clutched at the portfolio of anatomical charts under his arm, which fell and lay open at their feet at an introductory cut of human figures facing each other. She was the first to spring away,

while Professor Hardipan was angry, as so petty a vexation could make a petulant and tired man, ground his teeth and clenched his fist as he stooped down to pick up his charts. Unfortunately, however, the loop of his fur coat had caught in the button of her jacket and her recoil had been so sudden that the professor was literally jerked off his feet and fell upon his face before her. Books, cigars, and instruments were scattered by his side, and she perforce was bending over him. This tableau, however, was ended quickly for she stooped still lower (as if whispering into his ear as he afterward humorously said) to relax the tension of half his weight about her neck and unbutton the sudden attachment between them.

She might easily have sprung over his knees and gone on her placid way as the deep and rare oath of rage, whether at himself or her or the fates, were thus suddenly and relentlessly enmeshing him in their web, no doubt prompted her to do. Who shall tell why she lingered and helped collect his scattered luggage, while he slowly regained his feet? Why, before re-encumbering his arms with his parcels, did he not take her gently by the shoulders and waltz her around in half a circle safely to the other side of himself? Why above all did she notice the scratch upon his nose from which the blood was trickling and ask in the tenderest inflections that ever modulated a woman's voice, if he was hurt? Why did he reply only by a defiant snort of anger and thus lay up food for future remorse, as her sweet tones echoed and re-echoed afterward in the deepest chambers of his heart? Why did no one come along? Why had any one of the thousand things not happened so that they should not have met at all or a few rods sooner or later? If any of these things had been otherwise, the story of these eventful seconds in this unromantic spot, where the course of true love it was afterwards plain had proved all too smooth, would have ended here.

As it was, however, when he was up and had full possession of all his traps, Professor Hardipan seemed a trifle mollified, and he slightly—let us hope gracefully—inclined his head to his fair vis-a-vis as he was about to step lightly aside for her to pass. But once more, for truth is incredibly stranger than fiction, by one of those rare concomitant variations we often experience upon the street or sidewalk, where it is impossible always to turn to the right, she courteously and simultaneously did the same. Instantly both dodged back now but half the width of the narrow walk, and back and forth they went several times, each about the same distance and at the same rate.

It was a clear case of what Leibnitz called pre-established harmony between two human beings. No two pendulums, it seemed to the professor, ever swung with more perfect uni-

formity, and he declared afterwards that the awful thought occurred to him that they might if breath and muscle had been unfailing have gone on thus till morning. Each for an instant suspected the other of design, but as they paused and looked into the other's eyes, it was evident that all the thoughts and energies of both were now bent solely and intensely upon ending this most embarrassing encounter. Each threw a hasty glance behind as if with the thought of turning round and giving up the pass, but as they faced each other again it was evident that vexation had gradually begun to give place to another quaint, if somewhat scientific fancy, in the breast of the professor. It flashed across him that this must be a case of perfect identity of the personal equation which he had investigated and which has been said to be the same in no two human beings. Here were two independent human wills both automatically free, yet perfectly constrained and indeed checkmated as it were by the other. It suggested to his psychological mind an indefinite perspective of inner harmonies, which might be the other's fate, counterpart, or what you will, just as the hypothetical Brundusian ass if "exactly" between the two bundles of hay would surely die of starvation. Up to this moment at least he would have ridiculed the platonic legend that flitted through his mind of male and female created in pairs or rather as one monadic soul, which Jove later split like a sorb apple with a horse hair, and which malign fate had shuffled with other halves through the world. Here the halves of an original whole were brought together again in their rarest affinity. This timid, palpitating, blushing, yet courageous creature had awakened the greatest interest he had felt toward any individual in all her species these many years. His fair encounteress appeared to be the one in all the world peculiarly adapted to be questioned, observed, studied, experimented on at close range. She somehow seemed to carry a key essential to his deeper self knowledge. She might possibly some time be made to love him beyond the dream of the Patient Griselda herself, enough even if he required her to submit to X-ray ;—but no, such a thought at least must be absolutely forced out of his mind. Such, at any rate, is a tolerable account of Professor Hardipan's consciousness at the end of the first minute after he first saw the unknown girl, who still confronted him.

Thus it came to pass that it was with something like genuine good feeling that he said in tones more bland and apologetic than those he was wont to listen to from his own lips, the simple words "Please excuse me," as he was about to deposit his bundles in order we suppose to take her hand and chassé half round. Judge then of his utter astonishment to hear at the

same time the same words "Please excuse me" from her lips in perfect soprano accompaniment, not only of tone and pitch but inflection and cadence. He stood erect and stared into her face in dumb bewilderment. If his own shadow on the ground had risen up or his own image in the mirror had stood forth and spoken to him, it would have seemed no less a miracle. Nay, he could hardly trust his senses. It must be a dream or hallucination, a mirage and entoptic delusion, a ghost strayed from the rooms of the telepathic society or conjured up by some mischievous necromantic agency as yet unknown to man. Perhaps he was bewitched with a vision of beauty like the knight in Tasso's enchanted forest, and he must violently break the spell that was upon him. He stepped back, and like a mirrored reflection, she did the same. He decided to walk straight on, over or through the phantom, but she advanced apparently with the same hardy and desperate impulse, and he instinctively shrank back, and she did the same.

It was thus evident that not only their actions but quite likely their thoughts and feelings were falling into consonance; some mystic agency was cadencing their souls into complete unison. Would they ever be able to separate and go different ways? Each had perhaps hypnotized the other at the same time and in the same way and with the same kind of suggestion, for even such things he had read actually sometimes occur. How and by whom could such a spell that seemed to link their very souls be broken?

A faint smile, that had irradiated both faces for an instant, now vanished and both renerved themselves to quell this sudden apparition of destiny between them. Each sprang to the upper side and tried to clutch the snow on the high drift at the top with greater energy than before, but were only able to meet and by no means to pass each other. To whichever side each turned the other did the same, till the very gas lights in the distance seemed to wink and leer at them faintly, and yet more faintly. The curve of muscular fatigue itself was the same for both. It was no use, they must both with stoic resignation accept the inevitable with what joy they could. Nothing more could be done. Their very breathing and loud heart beats he fancied were both utterly and hopelessly synchronous. As they paused again and for the last time, chagrin and confusion not unmixed with anger and petty despair were depicted upon both countenances; but as their eyes mirrored each other again, each face brought home the utter ludicrousness of the strange adventure, dispelling all other feelings, and both broke forth into laughter. Lightly and cheerily it rang out upon the frosty air. His was lighter and heartier than his friends had ever heard, but hers kept both

time and tone, and some good genius prompted him to say "It is plain, miss, that one of us must turn back. Will you go my way or shall I go yours?" She faltered in reply, "I will go yours," and turned promptly about. The spell was broken but a far more lasting spell was upon his heart.

In emerging from that unfrequented walk, they found themselves in the south side of the park, and his house was just across the way. He ventured to ask her to allow him to attend her to her home after leaving his books and instruments at his own door. To this she modestly, yet with some evident embarrassment, consented. It was a long walk, but we will not prolong the story. "Will you go my way for life?" he said,—and they married a few months later.

Professor Hardipan, though by no means a model husband, has never been suspected of any designs of experimenting upon still less of analyzing his wife in the cause of science. His instincts are rather of an opposite synthentic sort, and three children have already blessed their union as I write.[1]

Mrs. Hardipan's version of this story is far less extraordinary. We have adhered strictly to his. Hardipan's miracle or conversion, as it was called by his cynical friends in the club, was regarded as an egoistic, semi-myth, gradually evolved to excuse to others and explain to himself how it was that such a man as he came to fall so suddenly and desperately in love. Gossips of the other sex have whispered that it was a coquettish woman's trick to catch the attention of an eligible, rough diamond of a bachelor. Some have declared it was a wager and that Jeanette Moore had even boasted beforehand how she would do something like the above. Others more friendly have declared it was in a spirit of pure, unpremeditated, girlish frolicsomeness that she dared to balk a bearish don, simply because it happened to come into her head to do so, on the street, where his face was well-known. For ourselves we have no theory about the matter, but are sure that no man can be happier than the professor, and we see no reason why, were he not a scientific man and a free thinker, he ought not to thank God daily that he has become, as in the strange providence of love every bachelor may, a married man.

---

[1] It is perhaps worthy of remark that this plain tale here told with literal and kinetographic truthfulness illustrates how severely the old classical unities of time, place, and action may be adhered to with the most objective conformity to facts; viz., whole time of action exactly two minutes; place or space of action 6 x 4 feet; action itself except the fall, an admitted defect, a *pendular sinus* vibration, the simplest of all dynamic unities on a plane surface of two dimensions. It is for these merits chiefly that this story claims a unique pre-eminence over all others ever written.

REPORT ON GEOGRAPHY.

The Report on Geography presented Nov. 15, 1901, at the meeting of the New England Association of School Superintendents by their committee, Superintendents Tarbell, Murdock and Nash, is an interesting contribution to geographical literature. The discussion is limited to geography in the elementary schools, but some important suggestions for more advanced work are made, as for example the outline of Professor Wagner's text-book on geography—p. 7.

The Report is divided into two parts, the first treating of the nature, value and aims of geography, its scope, limitations, and scientific aspect, together with a brief consideration of geography old and new. The second part considers the relations between geography and other subjects, methods of presentation, etc., and includes a somewhat detailed outline of work in this subject for the grades below the High School.

In addition to the points above noted, the committee have made an attempt to discuss the needs of the pupil through the periods of childhood and early adolescence with a view to adapting the presentation of the subject to the capacity and requirements of the pupil.

This part of the Report is especially commendable, not because the discussion is adequate, or in any way decisive, but for the reason that it is a recognition of the fact that a scheme of education is entirely dependent upon, and subordinate to, the nature and condition of the individual to be educated.

The committee seem to make a greater demand upon the periods of childhood and early adolescence than actual experience appears to justify (see pp. 24–25 and 26–27). This demand is also indicated in the plan of work for the grades below the High School, which provides for the presentation of matter that can hardly be assimilated at the ages indicated (pp. 27–60). Notwithstanding the possibility of securing a considerable knowledge of the elements of geography by an objective study of the immediate home environment, the fact remains that geography is and must be a representative subject which must be studied largely, if not entirely through illustrative material (models, maps, globes, pictures, reports of travellers, etc). This material in itself requires for its apprehension no inconsiderable experience, as well as a somewhat adequate knowledge of mathematics and physics. Even when these conditions are secured, it is very inadequate to the purpose to which it is devoted. The fact of the existence of an active imagination during childhood and early adolescence is not to be disputed, but it is not the trained logical imagination that is necessary for the apprehension of geographical relations.

Much matter that the committee regard as elementary should be delayed until the High School period when it may be presented scientifically. Much of the work done in geography in the grades below the High School is futile, and may be absolutely harmful. The modes of thinking known as cause and effect, and as science, have of course no existence in nature, and are only of value to the individual to the extent that they become to him the means of reaching a desired end with a minimum outlay of time and energy. Scientific work in geography as in any other subject can only mean an economical procedure, a process of the adaptation of thought to observed facts by which classifications and generalizations may be quickly reached. (See Mach. Die Mechanik, Leipzig 1897, p. 5.)

This economy in thinking, however, is only possible to a limited degree in childhood, hence the committee do well to delay the real work of geography until sufficient mental development is attained.

In the consideration of the scope and limitations of the subject, the committee have done well in trying to free geography from many of the subjects that have in some unaccountable way become attached to it. A valuable service has been done in eliminating all but the geographical determination (this latter being more historical than otherwise) of several sciences such as Botany, Zoölogy, Anthropology, Manufacture, etc., that have threatened to form a rather unmanageable appendage to geography. The committee have shown that only under special conditions do the processes and products of man's activity become facts of geography.

While limiting the subject on the one side, however, they seem to extend it unwarrantably on the other, inasmuch as they claim that, as a source of information, geography has no equal among its associated subjects. (p. 9.) The æsthetic and ethical values of the subject are very highly estimated (pp. 25–26) while they assert comprehensively that "geography offers a complete field for the cultivation of the mental faculties" (p. 25).

While admitting the immediate and practical value of the knowledge afforded by geographical study, we cannot rank this subject other than secondary as a source of information, while as a means of æsthetic or ethical culture, it must we think stand far below Literature and History. The study of the elements of geography has but a limited influence upon the character. The will is not developed, nor the feelings stirred as they are by a consideration of the actions of man.

The attempt to define geography has been as usual more or less unsuccessful. (p. 4–6). Reference to Webster, Worcester, the Century Dictionary, as well as to the famous Committees of "Ten," "Fifteen," and "Twelve" reveals definitions all more or less special and one-sided. The efforts of the present committee themselves are much more satisfying. On page 9 they state that the basis of geography is the earth, and not man. Not one of the definitions cited is in accordance with Professor Wagner's view of geography, which has (and we think rightly) called forth the approval of the committee, viz.; geography exhibits a distinct duality of character, looking on the earth from one point as a physical body, from the other regarding it as the dwelling-place of man, in which latter view it ceases to be more than a connecting link between Natural Science and History (p. 8). This view seems to be in accordance with the facts. Geography has to do with the relations of the earth to the other planets, and with the action and interaction of the elements of land, water and air, which constitute the earth. When life appears, though it be geographically conditioned, it cannot be regarded as strictly a geographical element, but must be looked upon as the starting point of an entirely different set of manifestations, organic, unified, and though, from the standpoint of evolution, dependent one upon the other, constantly differentiating, and becoming more and more highly specialized, and individualized.

As regards the discussion of methods of teaching, we may say that this is the least fortunate part of the Report. The definitions of method in teaching conveys no information either psychological or pedagogical and is in no sense distinctive. The discussion suggests the necessity for investigations into the actual presentation of this subject in the class-room.

The Report as a whole indicates not a little conscientious effort, and cannot fail to secure desirable results.

MARGARET K. SMITH.

LITERATURE.

The Training of Teachers and Methods of Instruction. Selected Papers by S. S. Laurie, A. M., LL. D., Professor of the Institutes and History of Education, University of Edinburgh. Cambridge: at the University Press. 1901. pp. 295.

This book is a collection of essays and addresses many of which have been published before but have been for many years out of print. Five of these are devoted more especially to the training of teachers and the teacher's work; the others discuss a variety of educational topics. Professor Laurie writes with conservatism and discretion, and he presents in this book a large body of wisdom in regard to education in general as well as certain English problems in particular. The nucleus of pedagogical common sense that it concerns every teacher to know is in great part to be found in these addresses.

The paper on "The University and the People;" and "The University of the Future" contains a description of the best features of the English universities and a sketch of Professor Laurie's ideal of the university of the future. The latter is based on the former, and is liberal and democratic. The question may fairly be raised, however, whether this ideal does not face the past rather than the future; for Professor Laurie makes a division between the things which pertain to the spiritual and intellectual life of man and those which have to do with his physical needs, and "Instruction in all the practical applications of science which have to do with bodily needs should," he maintains, "be outside the University and find a home in special Technical Colleges." No such rigid division is possible even to-day, and the college of the future will probably be still less able to divide the content of science and of culture into two parts, one of which constitutes "the true life of man," and the other dealing with practical affairs which have no scientific or culture value.

It was the reviewer's privilege to hear one of these addresses, the one on The Philosophy of Mind and the Training of Teachers, when it was delivered by Professor Laurie before the Teachers' Guild in London. The speaker gave a vigorous address, redolent of common sense, and with sound logic and somewhat heavy armored wit he put to flight the arguments of the English Münsterbergs, and maintained the thesis: "Sound theory is sound practice become conscious of itself; and every schoolmaster who would also be an educator should be conscious of the art he practices, so that he who is not born, or only it may be half born, may through that scientific consciousness be made; and that he who is born may have his consciousness enlightened and fortified." After the address, the reviewer inquired of an eminent English psychologist whether it was still necessary to set forth elaborate arguments to prove to teachers the advantages of studying psychology, the science underlying education. The reply was that in England this was still necessary. Unfortunately the same is true both in America and England to-day; and thus it comes to pass that strong men like Professor Laurie have had to spend a greater part of their time in repeating and enforcing the fundamental teachings of the Comenian Didactic instead of contributing something to the content of pedagogy and genetic psychology, the science at the basis of pedagogy.

W. H. B.

Tarr and McMurry Geographies. A Complete Geography, by RALPH S. TARR and FRANK M. MCMURRY. The Macmillan Co., New York, 1902. pp. 478.

This complete geography is hardly less copious than that of Frye, although much more easily handled. It contains 512 cuts, mostly well chosen, with many maps and rather copious treatment of seasons, wind, rainfall, temperature, etc. It is certainly a new dispensation of the stock material of geography with abundant modernizations and additions.

Physics, by FREDERICK SLATE. The Macmillan Co., New York, 1902. pp. 414. Price, $1.10.

The author attempts to get closer at a few points to the requirements of a situation that is now developing under our hands in the high school. He first treats the general properties of solids, liquids and gases in four chapters; heat and energy in seven chapters; while four chapters are devoted to light and three to electricity; with supplementary references to collateral reading; outlines of experiments and miscellaneous questions. There are one hundred and eight illustrations, all diagrammatic.

A College Algebra, by G. A. WENTWORTH. Ginn and Co., Boston, 1902. pp. 530. Price, $1.50.

This revised edition is intended for colleges and high schools, the first part simply reviewing the principles of algebra to quadratics. Some chapters of the old edition have been wholly rewritten, the order of topics changed, and the effort is to present each topic in the clearest light.

Proceedings of the Society for Psychical Research. London. Part XLIV, Vol. XVII. June, 1902. pp. 275.

This number is largely taken up with reports of sittings with Mrs. Thompson, no less than seven articles by as many different writers being devoted to her, including one by the late Mr. Myers. Thirty pages of book notes conclude the number.

Chapters on the History of the Arts and Crafts Movement, by OSCAR L. TRIGGS. Published by the Bohemia Guild of the Industrial Art League, Chicago, 1902. pp. 198.

This is by far the best story of the arts and crafts movement that has yet appeared. The book itself is elegant in form, and traces the movement back to Scott's mediævalism. It describes Carlyle's relation to the new industrialism; Ruskin's contributions to the doctrine of work; twentieth century economy; the omitted elements in political economy; William Morris and his plea for an industrial commonwealth; states the principles of the Hammersmith Socialist Society; Ashbee and the reconstructed workshop; Rookwood as an ideal workshop; the development of industrial consciousness; makes a proposal for a school and guild of handicraft; and characterizes the Industrial Art League, with full page portraits of Carlyle, Ruskin, and William Morris.

Children's Arithmetics by Grades, by WILLIAM E. CHANCELLOR. Globe School Book Co., New York, 1901 and 1902.

First book, numbers; second, fundamental operations; third, intermediate principles; fourth, essential elements; fifth, standard measurements; sixth, commercial affairs.

"This book," we are told, "is neither topical nor spiral in plan; its substance is neither ratio nor counting; its purpose is to conform

numbers in their facts and principles to the usual processes and powers and interests in children's minds." "The core of the concentric theory is recognition of the value of finding something that is known even in the mass of the unknown. Because comparing is the root and numbering is the top, let us not forget reckoning, which is the main trunk of arithmetic." The author believes in books, and fears oral instruction may be continued too long; hence his volumes are for reading and study rather than for setting many exercises in writing figures. It calls most for the quiet, studious effort of the child to think through the number processes for himself. There are cubes, clocks, rules, notes, dots, tables, geometrical figures, cords of wood, scales, etc. If there be too much matter in these six volumes, they are certainly very attractive.

Mediæval and Modern History. Part I. The Middle Ages, by PHILIP VAN NESS MYERS. Ginn and Co., Boston, 1902. pp. 454. Price, $1.20.

This is a revision of the first half of the author's Mediæval and Modern History published sixteen years ago, and will soon be followed by a companion volume, entitled "The Modern Age," revising and extending the second half of the original work. The first period treated is the dark ages; and the second the age of revival, including feudalism, the Normans, the papacy, crusades, Mongols, the growth of towns, universities and school men, the growth of the modern nations. There are twelve colored and three sketch maps. In material and form, the book is a model of its kind and leaves little to be desired.

Historical Sources in Schools. Report to the New England History Teachers' Association by a Select Committee, Charles D. Hazen, Chairman. The Macmillan Co., New York, 1902. pp. 299. Price, 60 cts.

In the first part, which treats of the usefulness of sources, the field of study is defined and sources are treated as a foundation, stimulus, and discipline. In the second part, ancient history is considered and divided into nineteen periods. The third part treats of mediæval and modern European history in thirteen periods; the fourth, or English history, in nine periods; while the last part is devoted to American history. As a whole, the work is invaluable for high school and college students.

Introduction to Physical Science, by ALFRED P. GAGE. Ginn and Co., Boston, 1902. pp. 359. Price, $1.00.

This is a new edition of a truly standard work with 256 well chosen cuts and illustrations, and happily without too much mathematics; with plenty of exercises for practice, for which one-third of the time is desired; and with all the text-book features emphasized.

Training the Church of the Future, by FRANCIS E. CLARK. Funk and Wagnalls Co., New York, 1902. pp. 225.

This is a valuable and summary statement of the author's views on the church of the future; methods of Christian nurture, past and present; the Society of Christian Endeavor as a training school, and other training classes. The appendix contains a model constitution, account of Junior societies, the civic club, home circle, Macedonian phalanx, the quiet-hour catechism, etc. It is based on a course of lectures on Christian nurture, with special reference to the Christian Endeavor Society, which have been given at various centers, and is extremely valuable as really the first comprehensive statement of work of this organization.

Manual of Astronomy, by CHARLES A. YOUNG. Ginn and Co., Boston, 1902. pp. 611. Price, $2.25.

This volume was prepared in response to a rather pressing demand for a text-book intermediate between the author's Elements of Astronomy and his general Astronomy, so that its material is largely derived from its predecessors; but everything has been carefully worked over, rearranged, and rewritten, and thoroughly brought up to date. It is copiously illustrated with 208 cuts, well indexed, and well provided with tables.

Childhood Society for the Scientific Study of the Mental and Physical Conditions of Children. Transactions, Vol. I, 1901. London, 1902. pp. 80.

Besides the portrait of Sir Douglas Galton, a list of the officers, expenses, gifts, and books in the library, and the annual report, this pamphlet contains valuable discussions by various members of the society on food dietaries in relation to school life; natural history methods of observation of children; methods of determining those that need special instruction; reading methods; effects of child study upon the social questions; school discipline, etc. Both the society and this first volume of its transactions bear interesting witness to the progress of this movement in England.

Spelling and Word Building. A Primary Vocabulary, by EUGENE BOUTON. University Publishing Co., New York, 1902. pp. 118.

This is a somewhat original method of approaching language work for very young children. The work is copiously illustrated in the main from things that appeal to child life and certainly contains new and interesting features.

The New Hamlet Intermixed and Interwoven with a Revised Version of Romeo and Juliet, by WILLIAM HAWLEY SMITH and the SMITH FAMILY, Farmers. Printed from the original manuscript, with text in full, and as first produced when done in action by the Smiths, their own company, under the haw tree, on their farm, at the thicket, June 17, 1902.

This play was composed by Shakspeare and the Smith family. Then it was done into a book, and bound in boards (No. 2 fencing), by hand, at the barn, on the farm, by farmers. J. W. Franks and Sons, Printers, Peoria, Ill. pp. 64.

This drama, which is printed upon calendered paper, is bound in two rough, knotty, pine shingles, with three tow strings, the whole being intended as a clever take off of some of the vagaries of the school of William Morris, the Arts, and Crafts people, and the Roycrofters. As "Wandering Willie" remarks in the dedication, "If Hamlet had married Juliet and Romeo been wedded to Ophelia, all would have lived happily ever afterward." Bacon did not write this play; it was made by farmers who make bacon, and this establishes the pedigree of the play, which cannot soil the slightest intellect, and "is guaranteed to be non irritating and unthinkable." "It can be administered without the least knowledge on the part of the recipient." Four generations of Smiths were represented in the cast.

Principles of Language Teaching, by J. J. FINDLAY. (Macmillan's Manuals for Teachers.) The Macmillan Co., New York, 1902. pp. 442. Price, $1.25.

After an introduction defining education, practice, etc., the author discusses motives in the selection of the curriculum for each period of child life, and thus passes up the grades, treating last of method, the acquirement of knowledge, school and class management.

Athalie, par JEAN RACINE. Edited with an Introduction and Notes, by F. C. De Sumichrast. (Macmillan's French Classics for School and College Use.) The Macmillan Co., New York, 1902. pp. 198. Price, 60 cts.

The author desires not merely a new edition of Racine's masterpiece, but to present it as a living play intended for performance rather than for quiet reading in study or class-room, and also to indicate the influence of the Greek drama upon the author and to show his biblical knowledge and its effect upon him.

A Manual of Civics for New York Schools, by C. W. BARDEEN. C. W. Bardeen, Syracuse, N. Y., 1902. pp. 699. Price, $1.00.

This work begins with the town, its power, officers; passes to the county and its court, the village, the city, thence to Greater New York and the State; discusses the bill of rights, elective franchise, how laws are made, courts, administration, duties of officers, taxation, academies and colleges, the President and his powers, Congress, and ends with various important documents and illustrative maps of the State of New York, for the understanding of which it ought to be a valuable contribution.

Studies in United States History, by SARA M. RIGGS. Ginn and Co., Boston, 1902. pp. 173. Price, 60 cts.

This plan is an effort to place before the pupils such topics, questions and matter as will lead to a thorough comprehension of the subject and also to present the subjects as a connected whole.

The Story of the Greatest Nations from the Dawn of History to the Twentieth Century, by EDWARD S. ELLIS and CHARLES F. HORNE. Parts 13 to 30 inclusive. 25 cents each. F. R. Niglutsch, New York.

This publication has now reached the thirtieth of the seventy-two parts. Each part contains twelve full page pictures, most of them from famous masters, illustrating historical events. The complete work will contain nine photogravures, nine maps, about nine hundred full page illustrations, and hundreds of text illustrations. Altogether it will make one of the most interesting and comprehensive aids to the study of history that have yet appeared.

The Kokka. A Monthly Journal of Oriental Art. No. 135. Published by The Kokka Company, Tokyo, Japan, Jan., 1902.

This monthly journal of Oriental art reached its one hundred and thirty-fifth number last January. Each contains about half a dozen full page plates, often colored, of Japanese or other Oriental paintings by famous artists. The whole is about 11 x 15 inches, gilt edged, is never folded, and is altogether a very attractive and valuable publication.

Sketches of Great Painters for Young People, by COLONNA MURRAY DALLIN. Silver, Burdett and Co., Boston, 1902. pp. 293.

This is dedicated to Larkin Dunton, late of the Boston Normal School, and describes briefly twenty-one of the great painters. There are nearly sixty illustrations.

Ten Englishmen of the Nineteenth Century, by JAMES RICHARD JOY. The Chautauqua Press, New York, 1902. pp. 260.

The ten chosen are Wellington, Canning, Stephenson, Russell, Cobden, Peel, Shaftesbury, Palmerston, Gladstone, Disraeli.

Literary Leaders of Modern England, by W. J. DAWSON. The Chautauqua Press, New York, 1902. pp. 275.

The writers treated are Wordsworth, Tennyson, Browning, Carlisle, and Ruskin.

A Survey of Russian Literature, with Selections, by ISABEL F. HAPGOOD. The Chautauqua Press, New York, 1902. pp. 279.

The first chapter treats of the ancient period to 988; the seventh period ends with Tolstoi and Gorky and other modern writers; and each chapter has bibliography with questions for review.

English History Told by English Poets, by KATHARINE L. BATES and KATHARINE COMAN. The Macmillan Co., New York, 1902. pp. 452.

This work embodies a unique idea which is well carried out. Shakespeare leads and is given a third of the entire volume, but a score or more of other authors are included. One of the best things about the book is that it is not sadly encumbered by notes. Those introducing the different selections are especially judicious.

The Story of a Living Temple. A Study of the Human Body. By FREDERICK M. and MARY H. ROSSITER. F. H. Revell Co., New York, 1902. pp. 348.

The object of this book is to arouse in them a deeper interest in the study of the human body. Lack of this causes youth to decay for lack of knowledge. It is based on experience in teaching. The titles of the chapters themselves are suggestive—the wonders of the temple; its living walls and how to keep them beautiful; touch cells and living wires; the pathway of taste and smell; the windows of the temple; a living camera; its entrances; the sanctum sanctorum; the living fountain and streams of life; the living canal; the inner doors; the bread of life; etc.

The Earth and the World, How Formed? by ABRAHAM G. JENNINGS F. H. Revell Co., New York, 1900. pp. 296.

This book treats the nebular hypothesis in its relation to planets, the earth, astronomers, and scientists, and then considers the atomic age of creation, processes that formed the earth, the aequous age, influence of the moon, carboniferous age, modifications of the earth's surface, action of water, chemical changes, great deluge, the sun and Mars, etc.

The Great World's Farm, by SELINA GAYE. The Chautauqua Press, New York, 1902. pp. 283.

This work is illustrated by several full page cuts, and treats of soil makers, carriers, binders, water, deserts, roots, climate, seeds, friends and foes, etc.

Money and Banking. Illustrated by American History, by HORACE WHITE. Ginn and Co., Boston, 1902. pp. 474. Price, $1.50.

Part one treats the evolution of money and considers it as a commodity; treats of coinage, legal tender, gold as a metal, its production and standard, the Latin Monetary Union and the International Conference. The second part treats of Colonial and Revolutionary bills of credit, greenbacks, Confederate currency, after the war, and the panic of 1893. Part three treats of banking in seventeen chapters.

Shall We Drink Wine? A Physician's Study of the Alcohol Question, by JNO. MADDEN. Owen and Weihbrecht Co., Milwaukee, 1899. pp. 220.

After a brief history of alcoholic beverages, the author treats of their constituents, food value, their power as stimulants, effects upon digestion and assimilation, general pathology, alcoholic heart disease, irritation of other organs, effect on nerves, embryonic tissue, insanity, who become drunkards and why, what is inebriety, effects on civilization, how to combat the evil, etc.